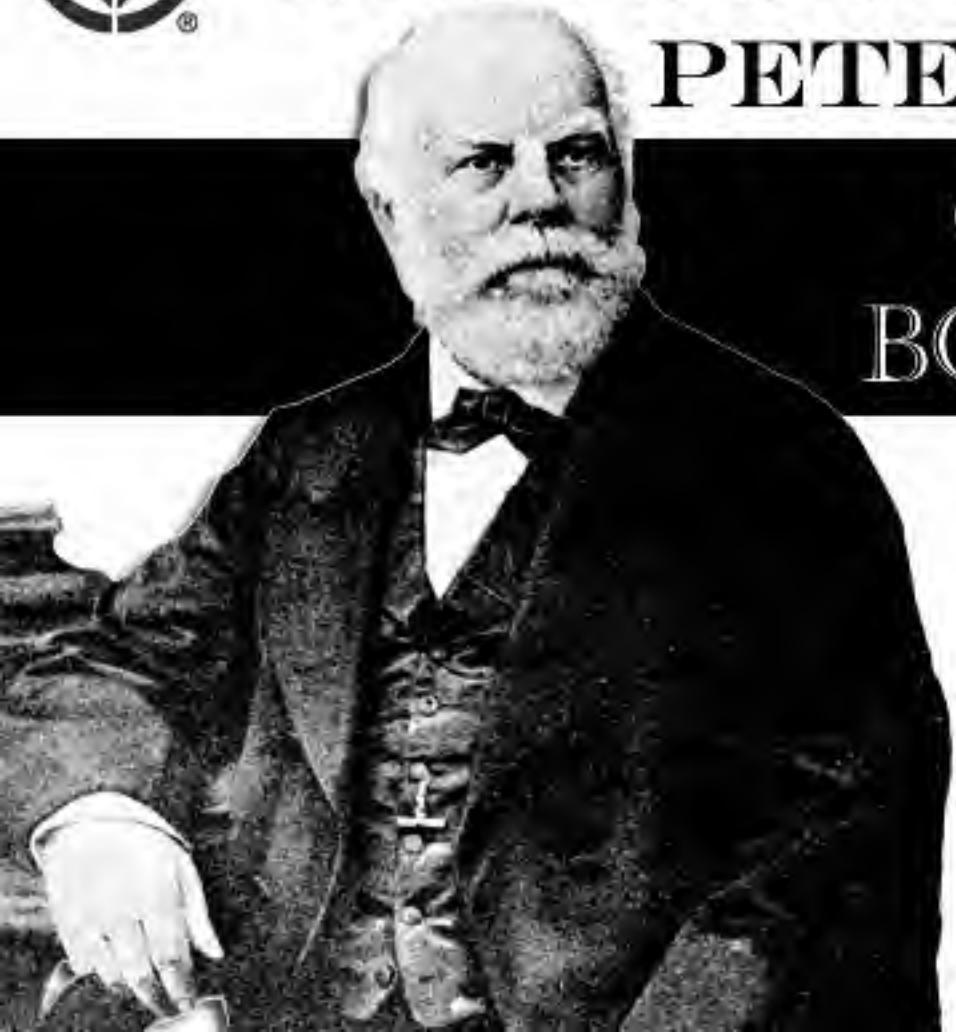




MISSOURI BOTANICAL GARDEN

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GEORGE ENGELMANN BOTANICAL NOTEBOOKS

Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

P. longidensum
var. *valdivia*

123-134

identical with, *P. acuta*, Hall. It has the same form and arrangement of the cells, with the exception of the cells being as large on the outside as on the middle rows. It differs, moreover, in the edges of the branches not being acute but rounded, but above all by the existence of a central lamella or plate which separates the opposite and less flattened portions of the bryozoon.

Geol. Pos. & Loc.—Upper Silurian, Columbus, Ohio.—
[Illinois State Collection.]

microspore 0.40

Candy $\frac{21}{9}$ 0.32 - 0.47

Java	—	$\frac{25}{9}$	0.41 - 0.48
		9	0.40 - 0.45
			0.39 - 0.46
Japan	4	11	0.38 - 0.47
			0.37 - 0.43
Porter	—		0.40 - 0.49
Candy Nov.			

microspore 0.026

Candy $\frac{21}{9}$ 0.025 - 0.027

Java	—	$\frac{25}{9}$	0.026 - 0.027
		9	0.023 - 0.027
			0.025 - 0.027
Japan	4	11	0.024 - 0.027
			0.024 - 0.029
Porter	—		
Candy Nov			0.027 - 0.031



0
cm

1 2 3 4 5 6 7 8 9 10

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13810

	JA	FE	MA	AP	M	J	J	AU	S	O	NOV	DEC
1861...	32.2	40.4	44.8	58.1	64.1	76.9	77.5	78.6	69.1	57.9	46.0	39.7
1862...	28.9	30.2	43.2	55.0	69.7	75.1	81.2	80.7	72.1	57.3	42.6	41.3
1863...	36.8	35.7	43.6	57.4	65.5	71.9	77.2	77.5	69.2	48.0	43.7	35.9
1864...	29.2	38.3	40.7	51.4	69.4	78.9	83.5	78.8	72.9	53.1	44.9	30.4
1865...	28.1	38.4	46.7	56.8	68.8	80.7	77.7	78.1	77.8	58.8	48.0	30.8
Mean	31.0	36.6	43.8	55.7	67.5	76.7	79.4	78.7	72.2	57.0	45.0	35.6
												56.4

RELATIVE HUMIDITY.

1861...	72.2	63.3	64.5	61.5	66.3	70.8	66.3	69.6	77.3	76.6	69.0	74.3	69.5
1862...	85.3	73.9	70.8	67.0	57.3	67.0	66.8	64.3	74.2	67.2	69.5	74.6	69.8
1863...	79.2	81.7	68.1	57.2	59.4	67.7	68.6	70.7	68.2	74.4	67.4	79.5	70.2
1864...	75.6	62.7	70.0	69.8	56.4	61.5	62.8	69.0	64.1	67.9	74.2	75.5	67.4
1865...	74.6	72.0	66.1	66.8	62.1	67.9	77.4	71.7	76.8	74.1	62.3	78.8	70.9
Mean	77.4	70.7	67.9	64.5	60.3	67.0	68.4	69.1	72.1	72.0	68.5	76.5	69.6

0
cm

1 2 3 4 5 6 7 8 9 10

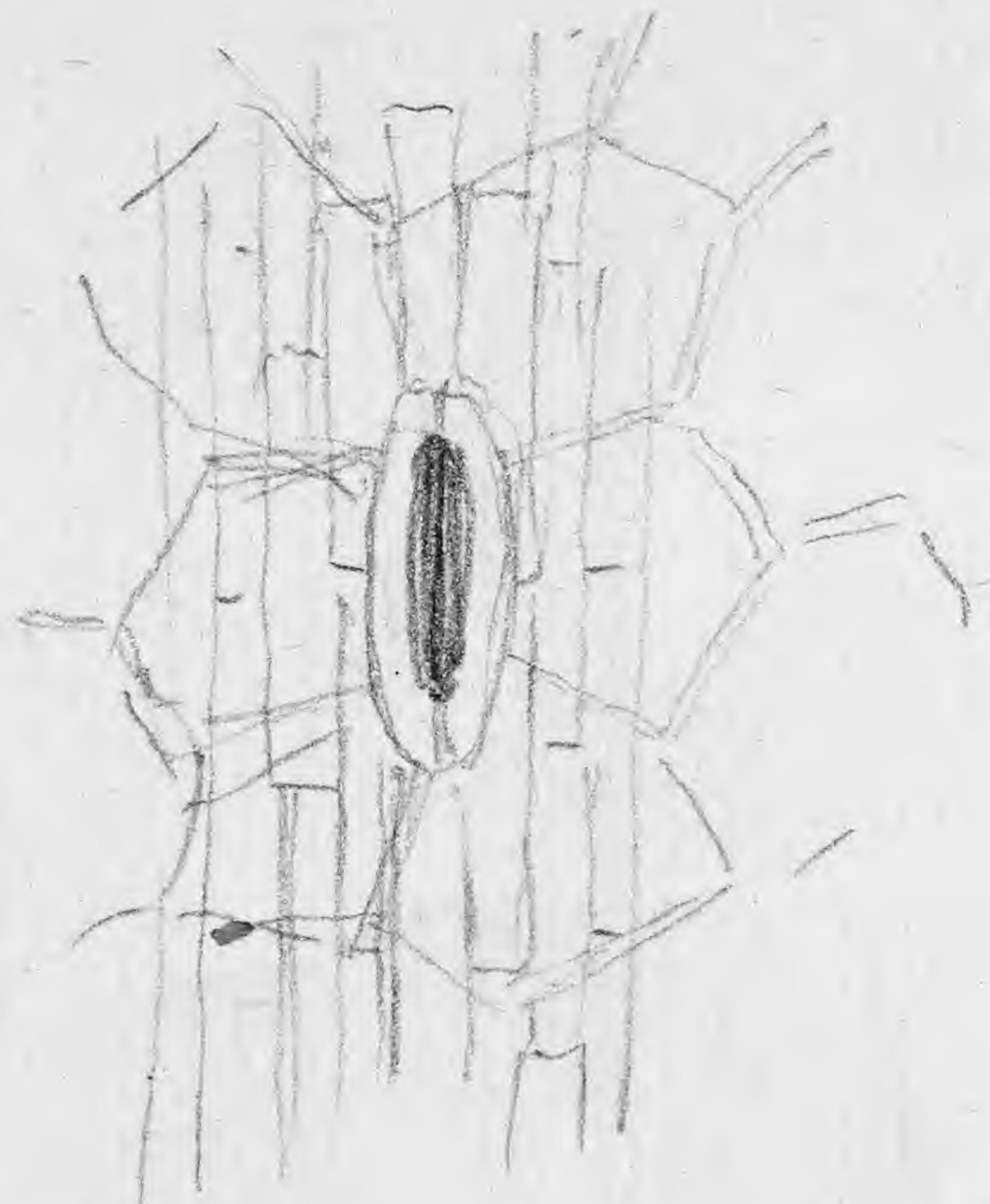
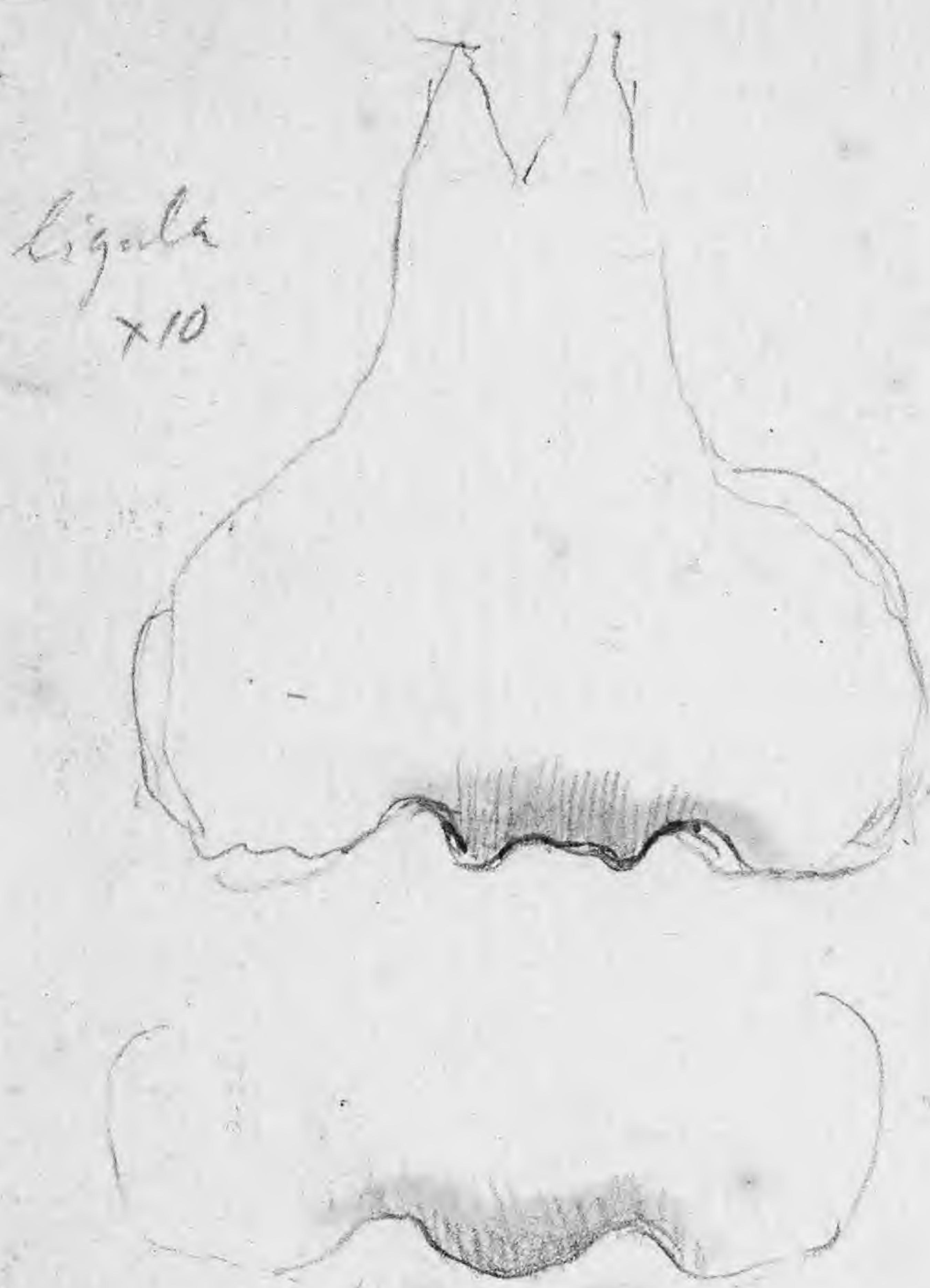
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MISSOURI
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GARDEN

Isotoma No 1 valida
Delaware

June 20 1866

Canby June 16



large plant with
long velum

No 1 is the larger plant
with long velum, very
flat lobed bulb which
seems possible perhaps
3 years. Spores very
small yet violet,
not yet grown.

Leaves strongly variate
above, 40 or 50
both forms with stomata



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13811

ALEX. TENCH,

APPARATE AND CUEMISS,

Marble Building, Cor. Fourth and Olive Streets,
ST. LOUIS, MO.



0
cm

1

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9

10

copyright reserved

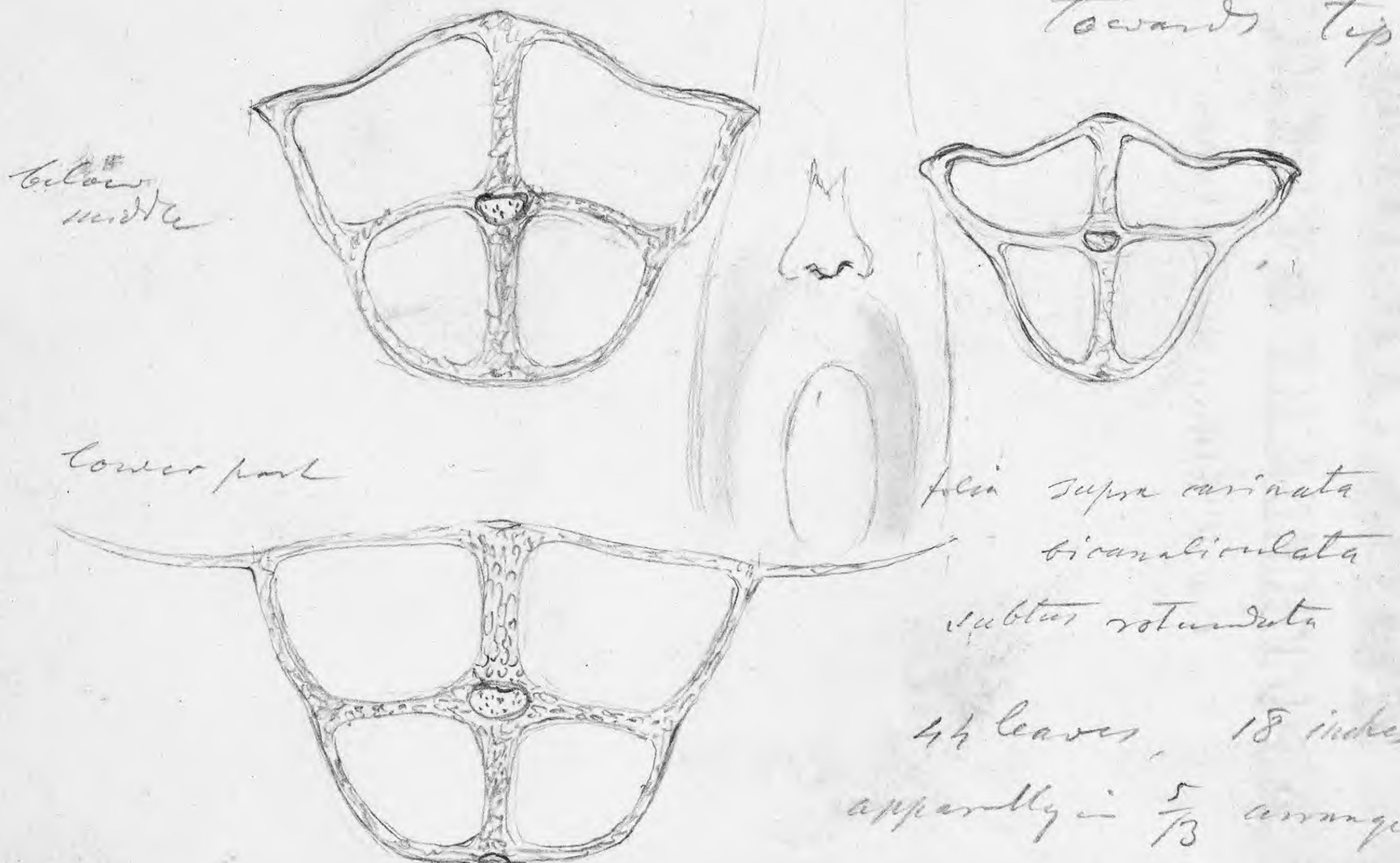


MISSOURI
BOTANICAL
GARDEN

Isoetes N. 1 *valida*
Delaware, Canby
part of leaf $\times 10$

June 20 1866

base of leaf
 $\times 2$



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13812

ALEX. LEITCH,
APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

Isacta No 1 valida

June 22 1866

Delaware, Canby June 16

horizontal sect x10

vertical sect x10

velum

ligula



0

1

2

3

4

5

6

7

8

9

10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13813

ALEX. LEITCH,

APPRECIARY AND CEMUS,

Marble Building, cor. Fourth and Olive Streets,

ST. LOUIS, MO.



0
cm

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copyright reserved



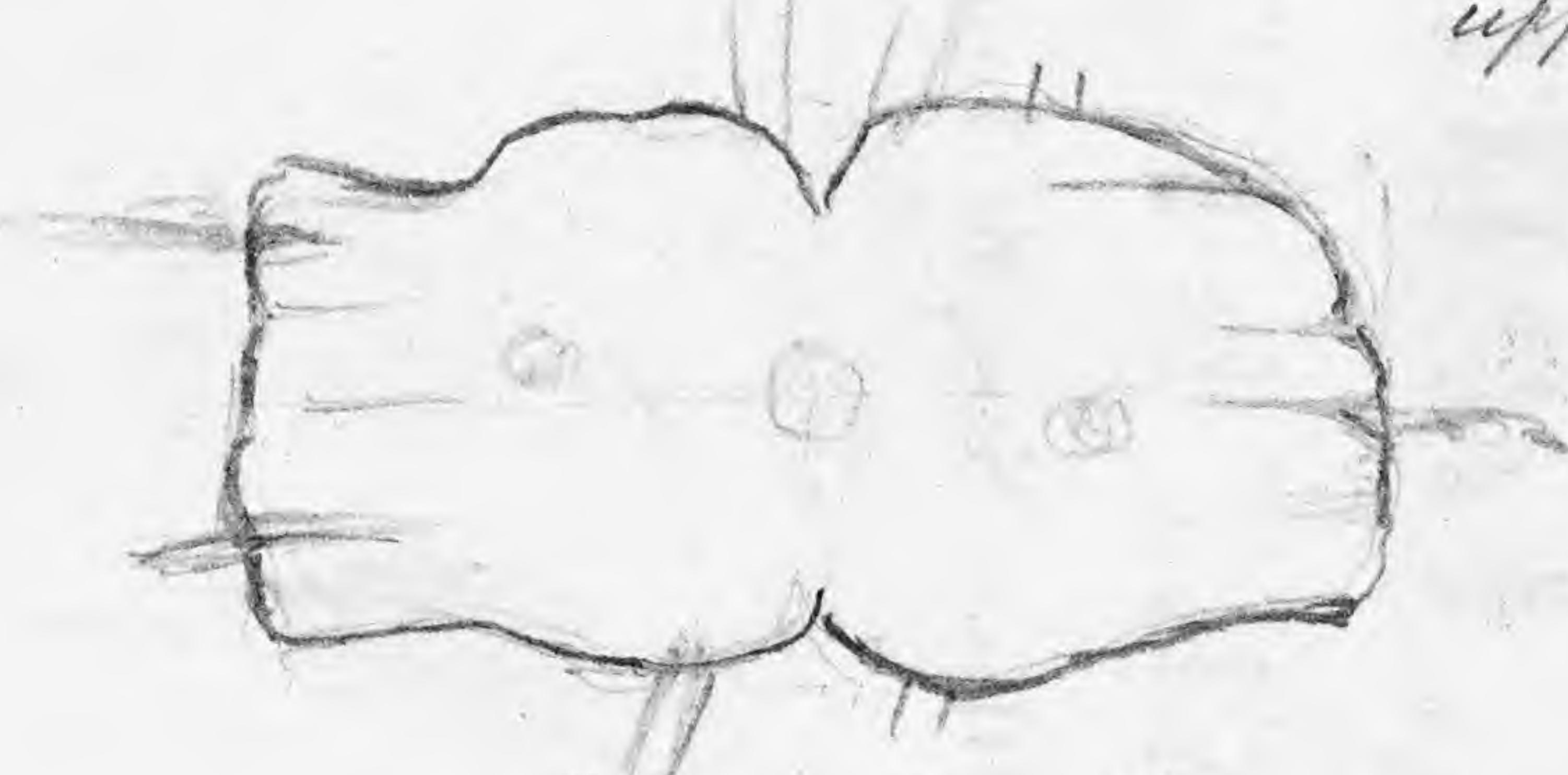
MISSOURI
BOTANICAL
GARDEN

Isocoma N. 1 valida June 20 1866
Delaware
Canby June 16



sect of bulb x 2

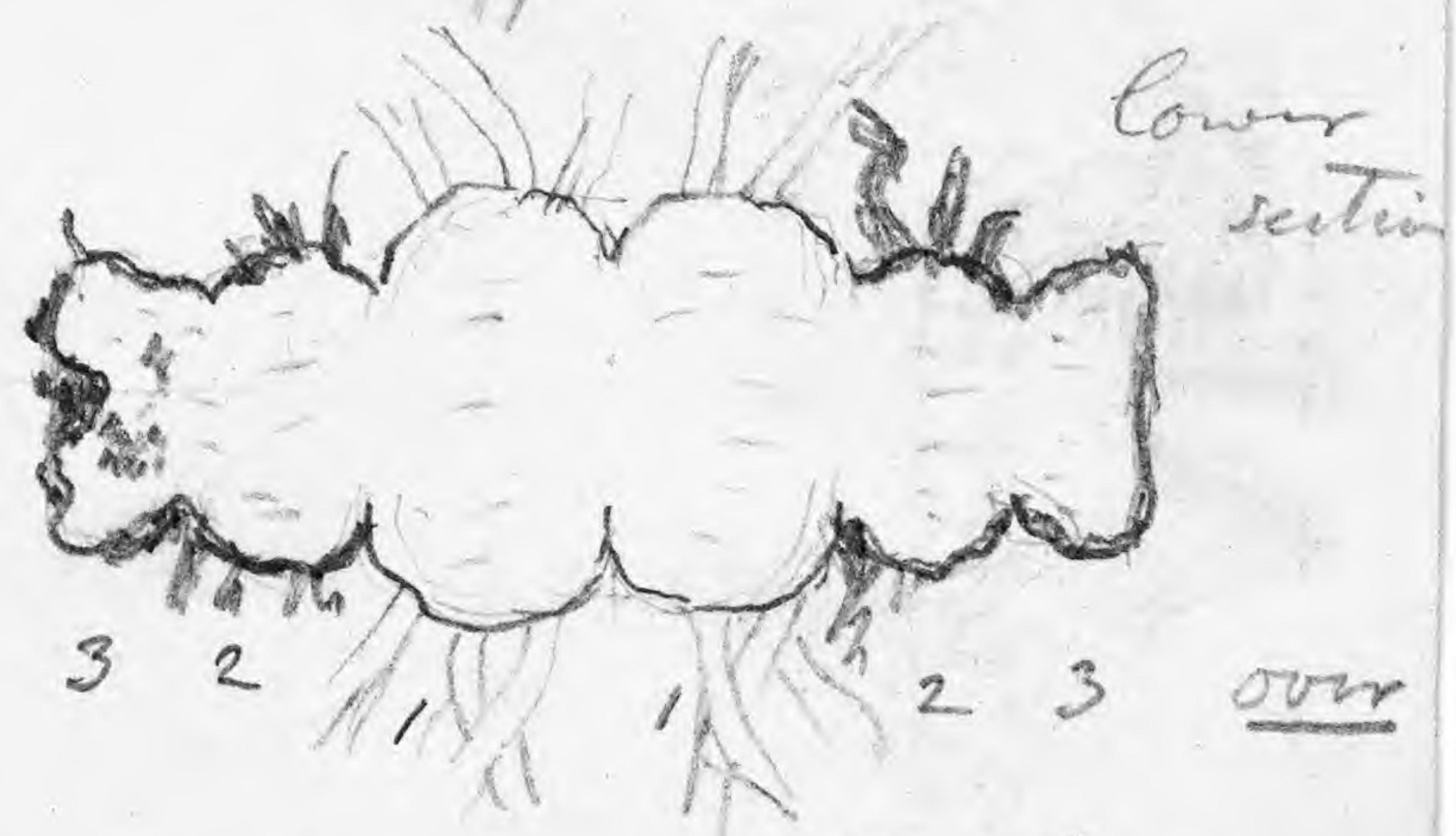
leaves 18" long, 40-45"



another bulb

longitudinal sections
of same x 2

upper

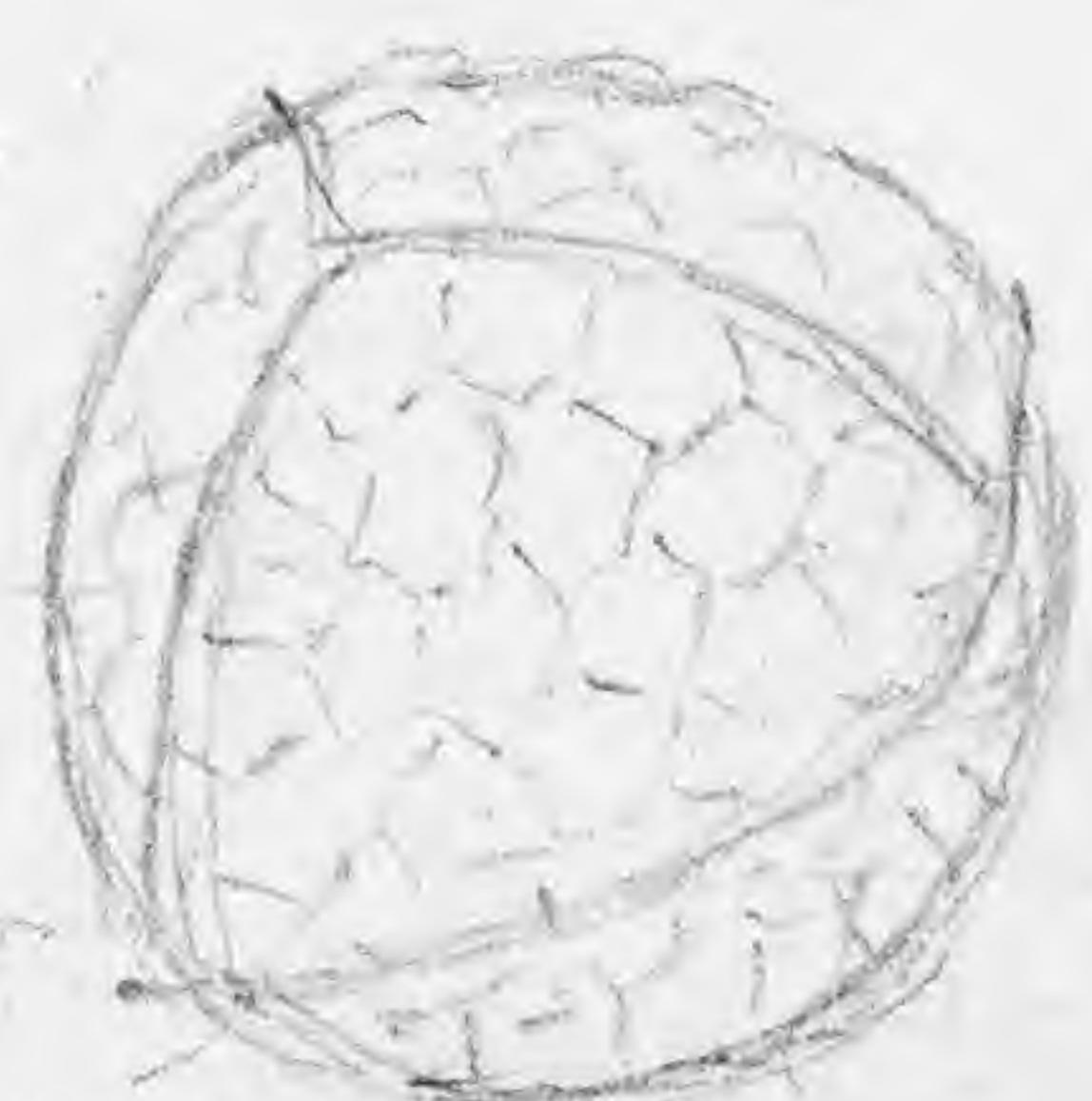


lower
section

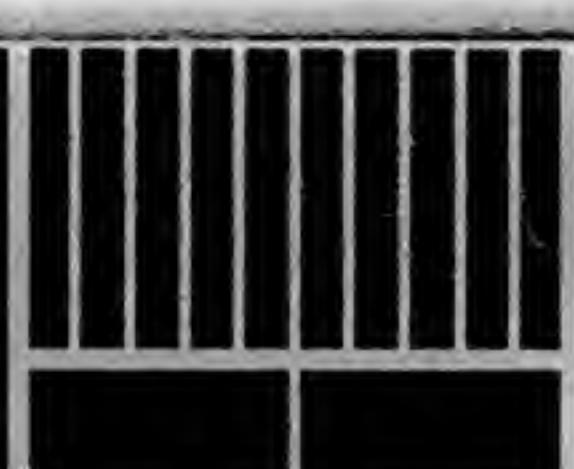
spores x 60

unripe

surface (apparently
smooth, or) when dry,
very finely reticulated



leaves 4 foot long



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13814

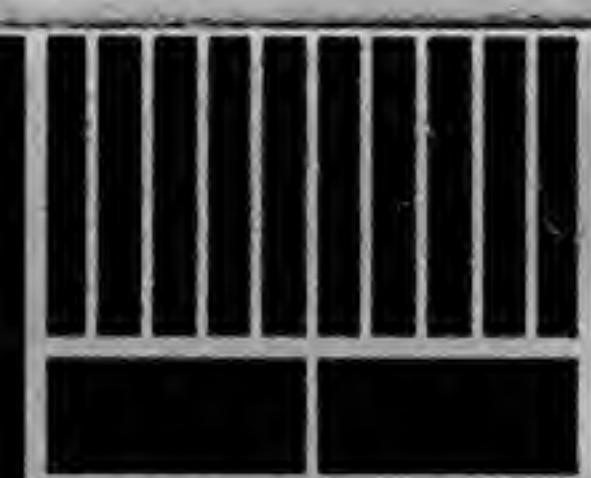
Alex. Leitch,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.

1. is the bulb of this year
2. last years growth
3. two years ago

at the end of this the bulb is
truncate, probably where the halber
of the bulb of three years ago has been
thrown off.



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

Hedera valida

Nov 20 1866

foliis longissimis

Wm 1111 Canby

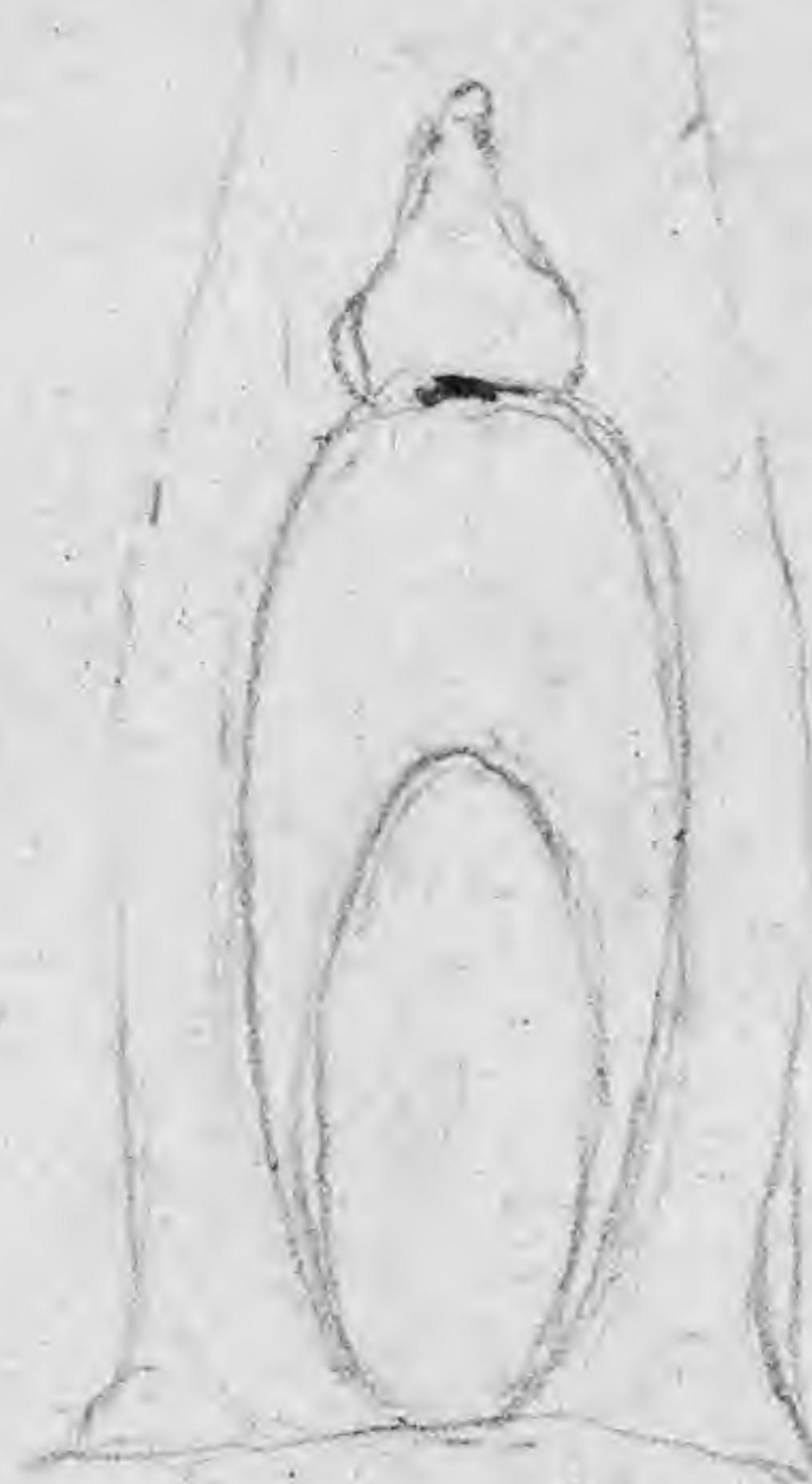
Diam of spores

$$\frac{24-29.5}{60} = 0.40-0.59$$



$$\frac{11-13}{60} = 0.027-0.031 \text{ mm}$$

x 2



0 1 2 3 4 5 6 7 8 9 10

cm

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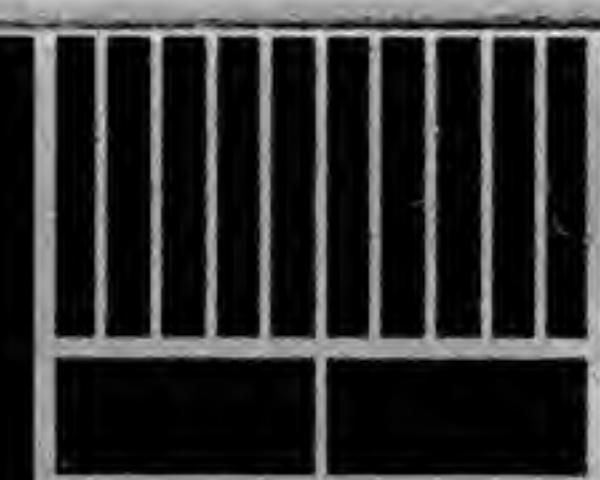


MISSOURI
BOTANICAL
GARDEN

138/5



Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

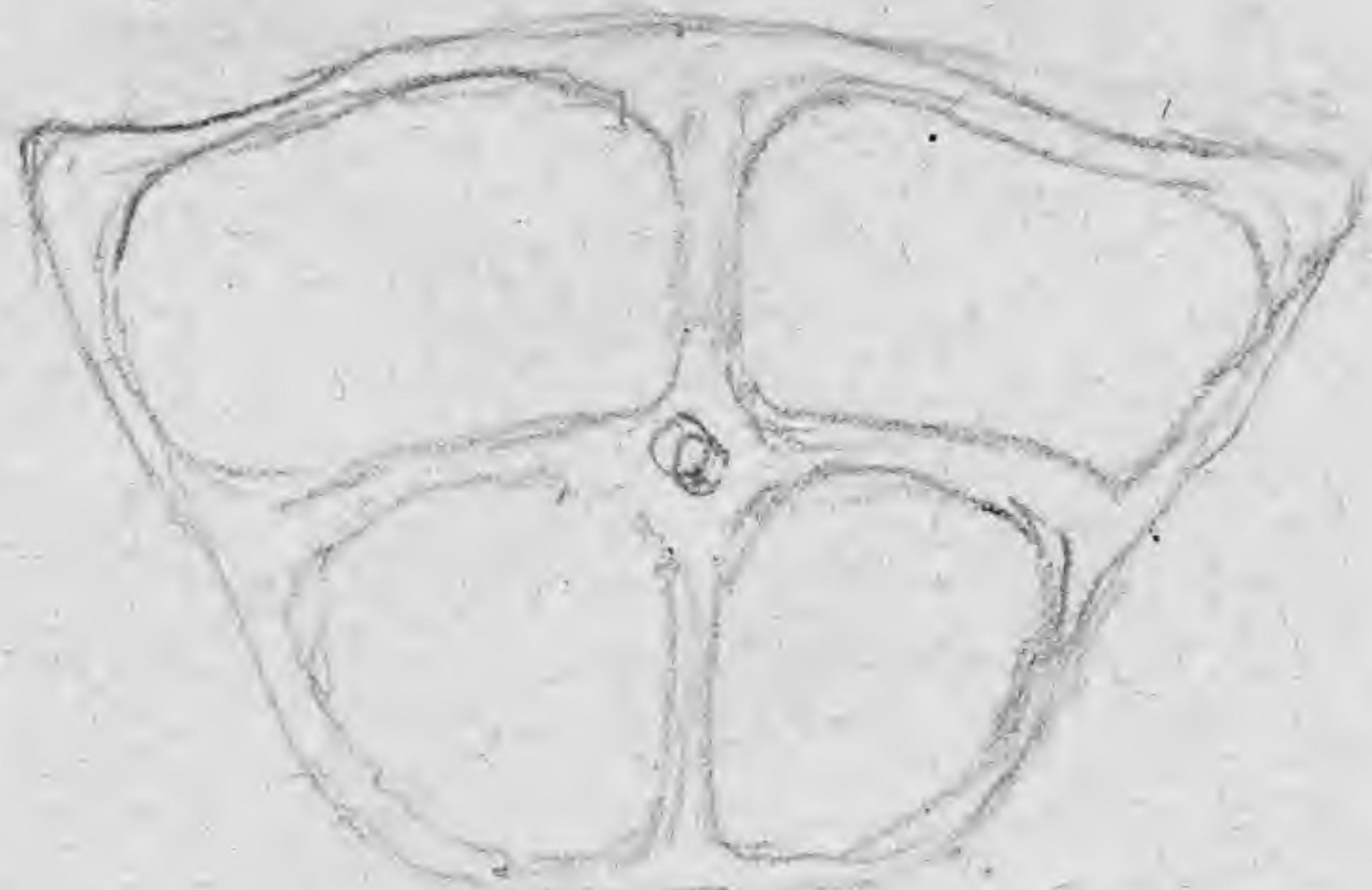
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MISSOURI
BOTANICAL
GARDEN

Zoster validus 32 Oct 6 1866
Wilmington, N.C. Sept 25 1866

scut x10



x15

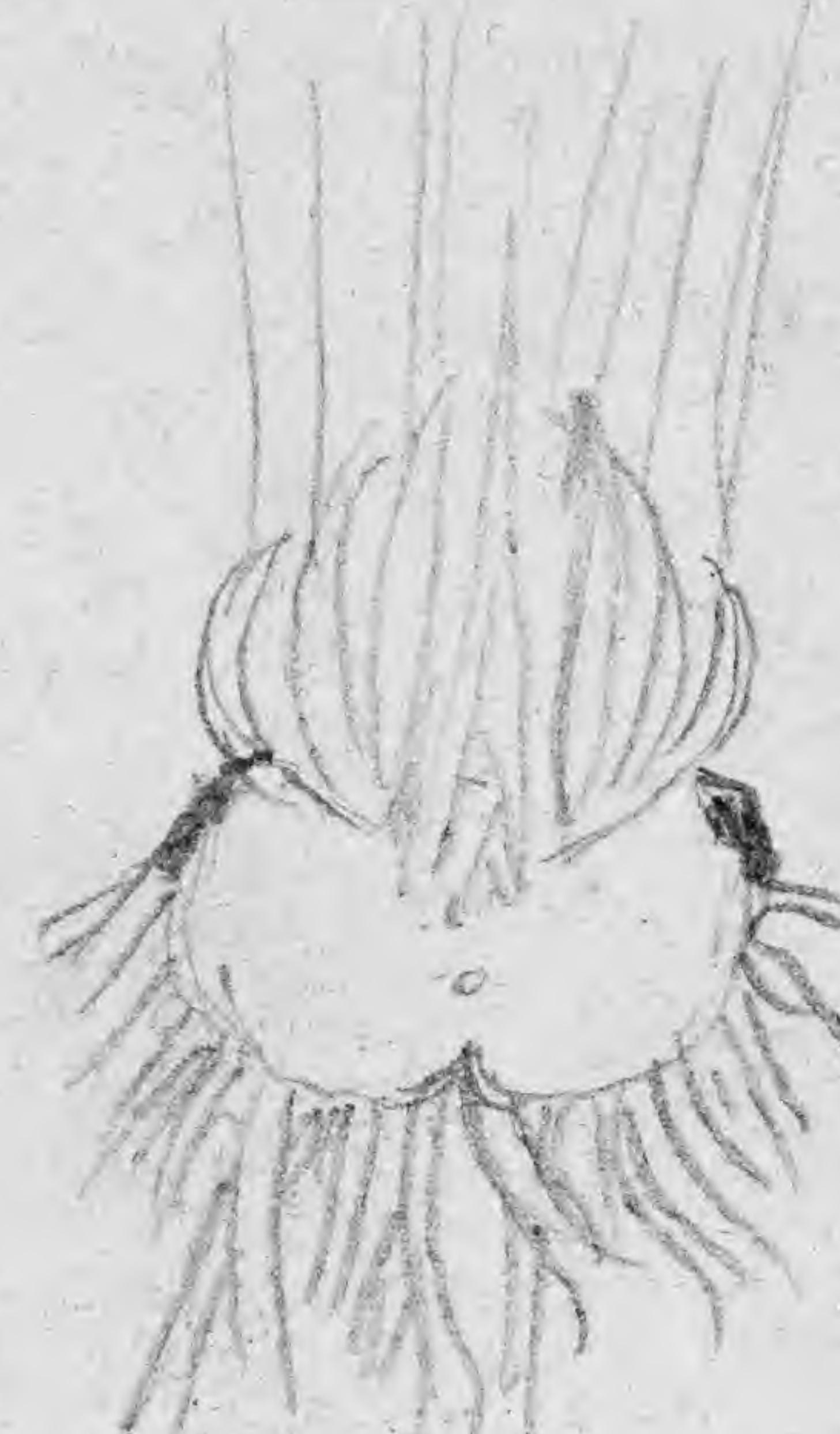
0.023-0.027

15-20

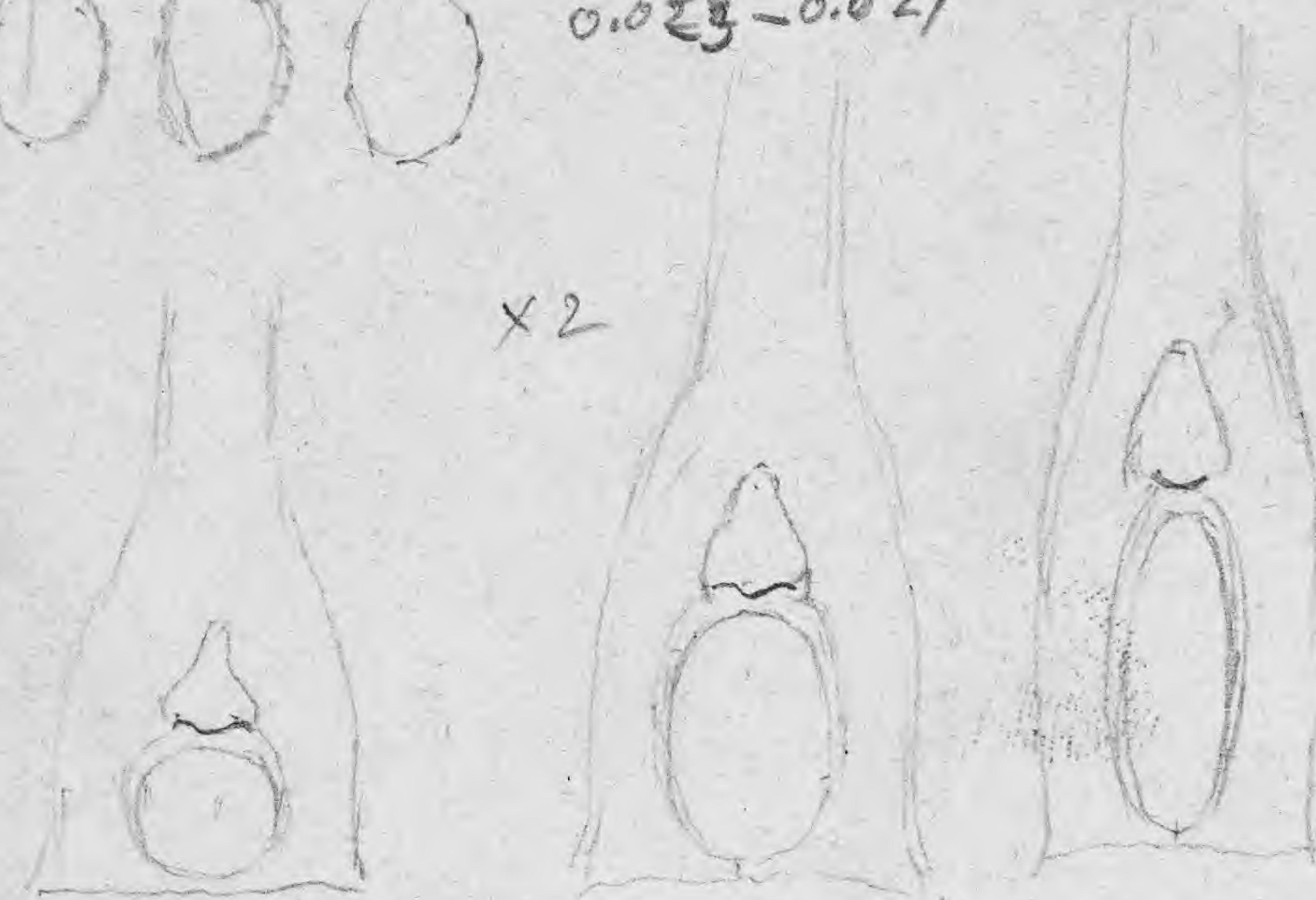
leaves 18-21

inches long

x2



x2



all macrosporangia
bearing leaves - outer and
inner

Diam of spores x60

= 24-27 mm

60

= 0.40-0.45

mostly 0.43 mm



0 1 2 3 4 5 6 7 8 9 10

cm

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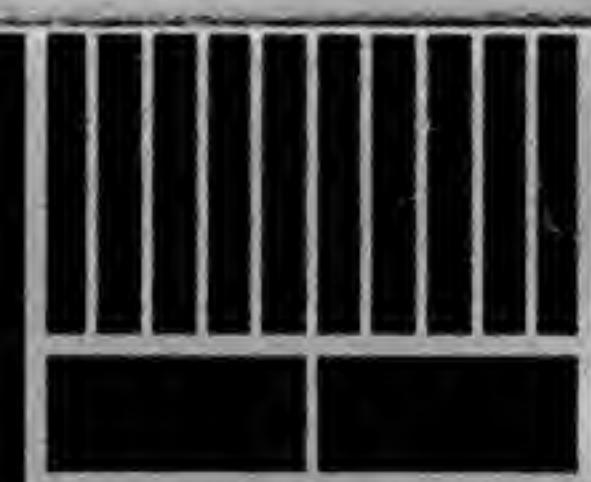


MISSOURI
BOTANICAL
GARDEN

13816

ALEX. LETTICE,
APOTHECARY & CHARMAGEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

Isostes veloides
pana.

Oct 6 3 1866

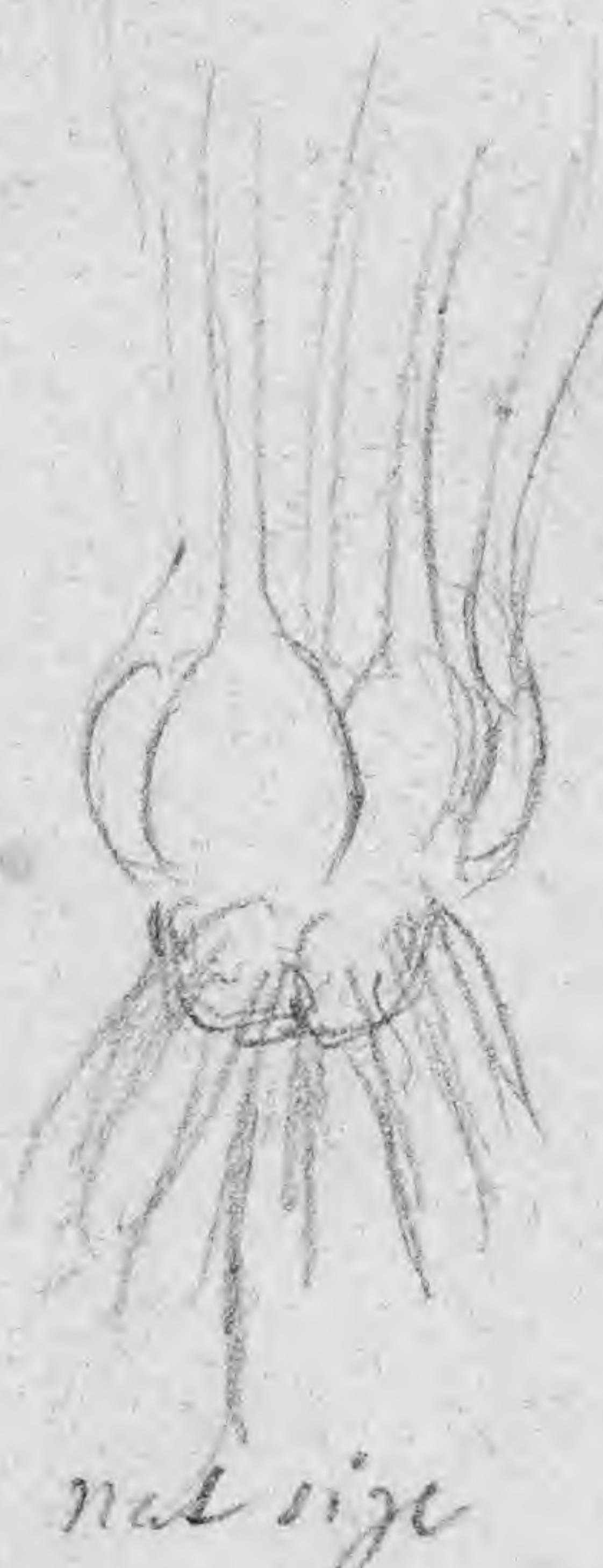
12-15 leaves
Canty, W. Conwy Sept 25 18-20 inches

long

26.4 - 29 mm

6a

= 0.41 - 0.48 mm

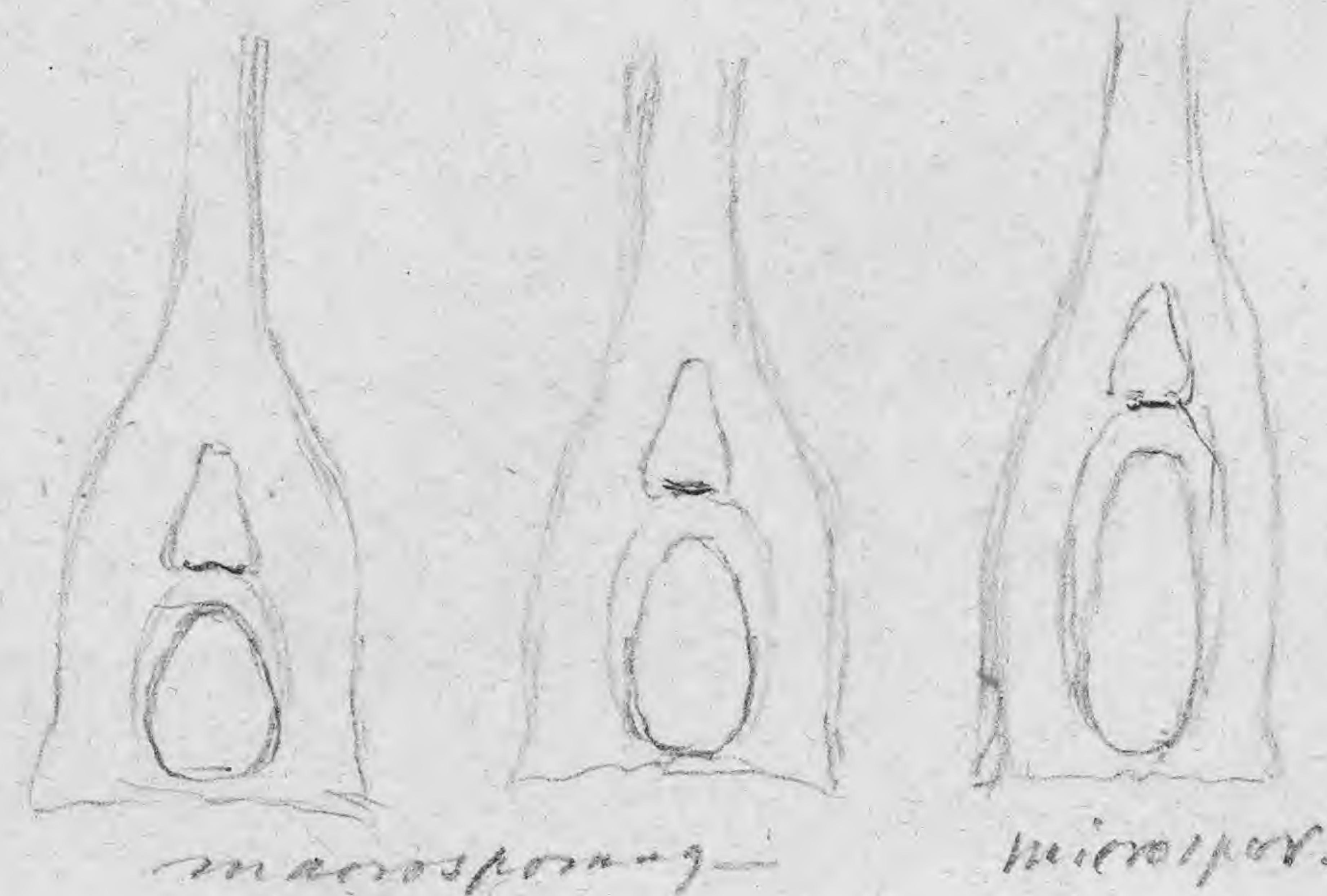


x 10



sort of leaf'

nat size



10-11 mm
= 0.024 - 0.027 mm



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



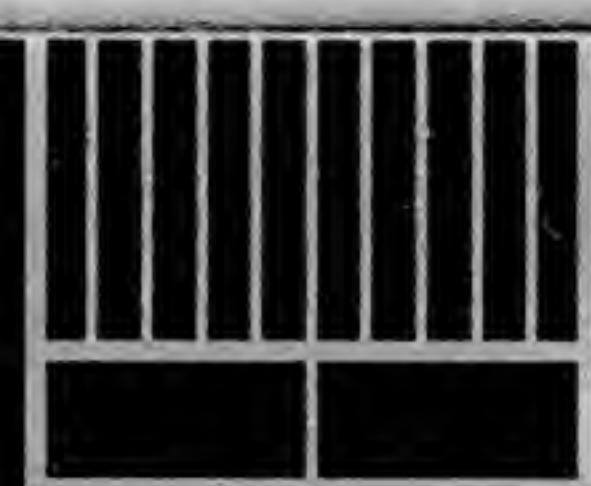
MISSOURI
BOTANICAL
GARDEN

13817

ALEX. LEITCH,

APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0

1

2

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4

5

6

7

8

9

10

cm

copyright reserved



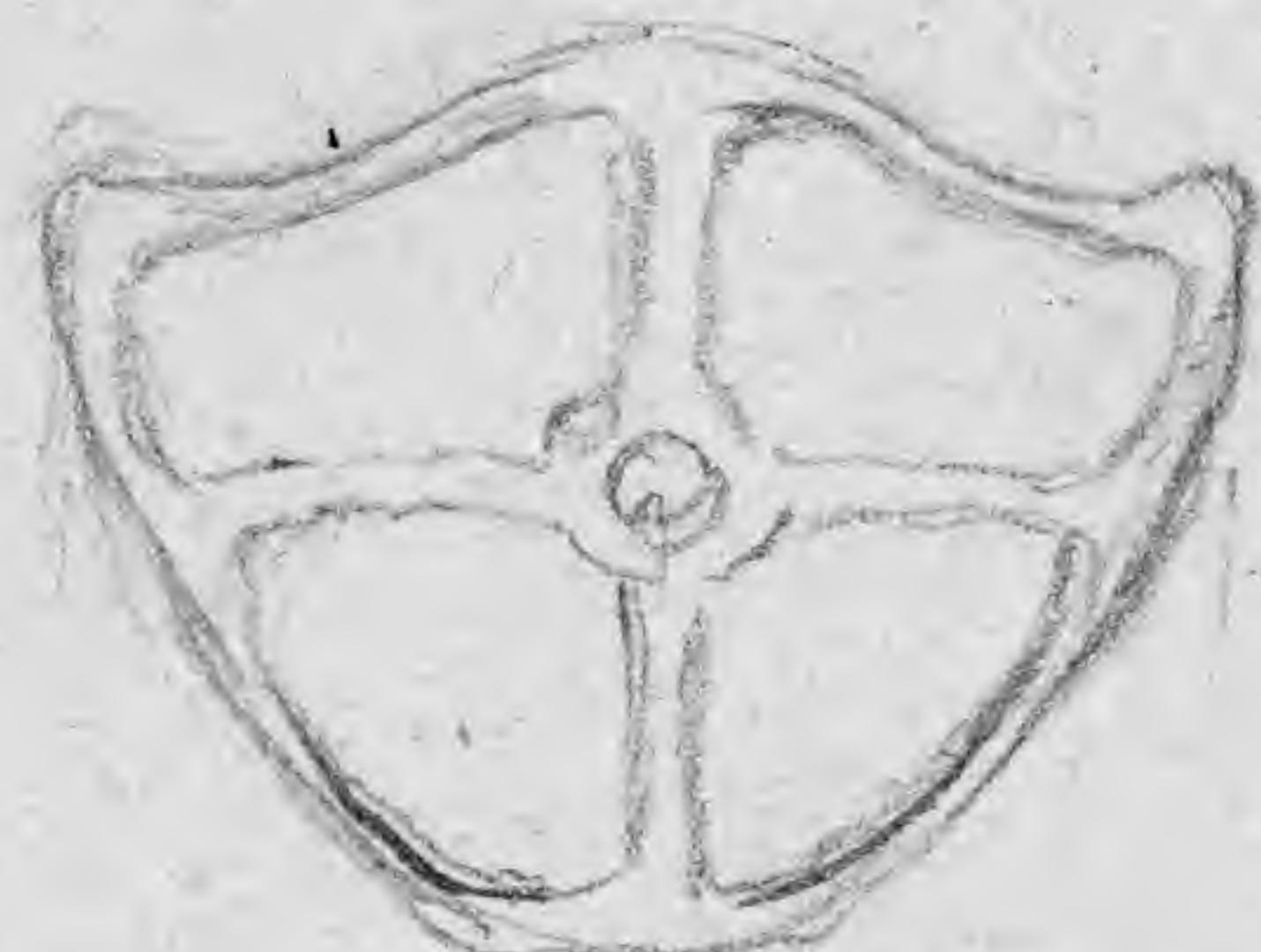
MISSOURI
BOTANICAL
GARDEN

Isoetes validula patra

Oct 3² 1866

Wilmington, Canby Sept 25- 1866

seed of leaf x10



x2



$$\frac{10-11}{415} = 0.024$$

-0.027 mm



x2



18 leaves

19 inches
long

all leaves with
macrospores have
fallen off & only
microspores remain

a very unusual form of frond



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



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BOTANICAL
GARDEN

38/8

ALEX. LETTICH,
APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10
cm

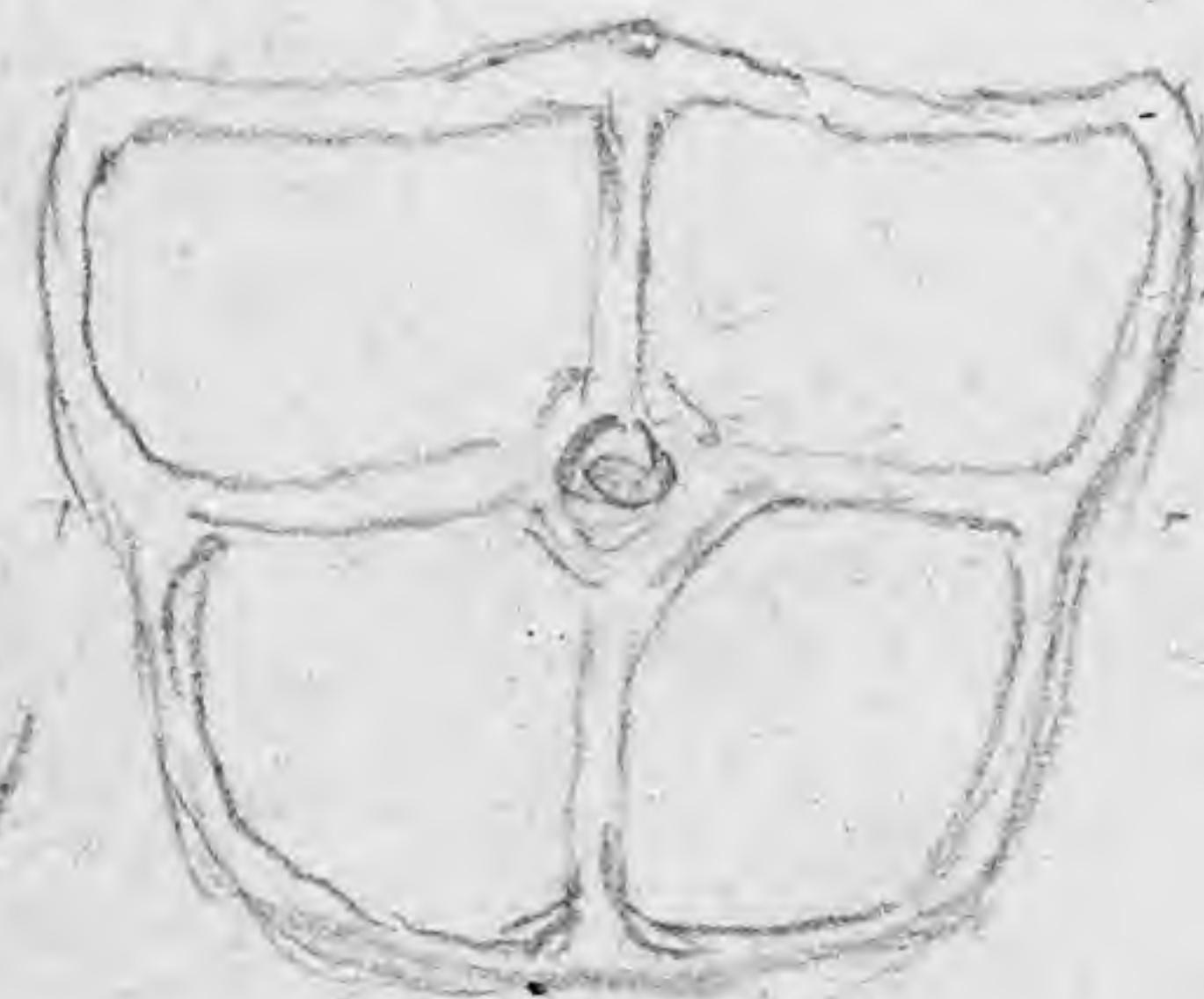
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MISSOURI
BOTANICAL
GARDEN

x10

scrt
through
middle of
leaf



Botrya validula?

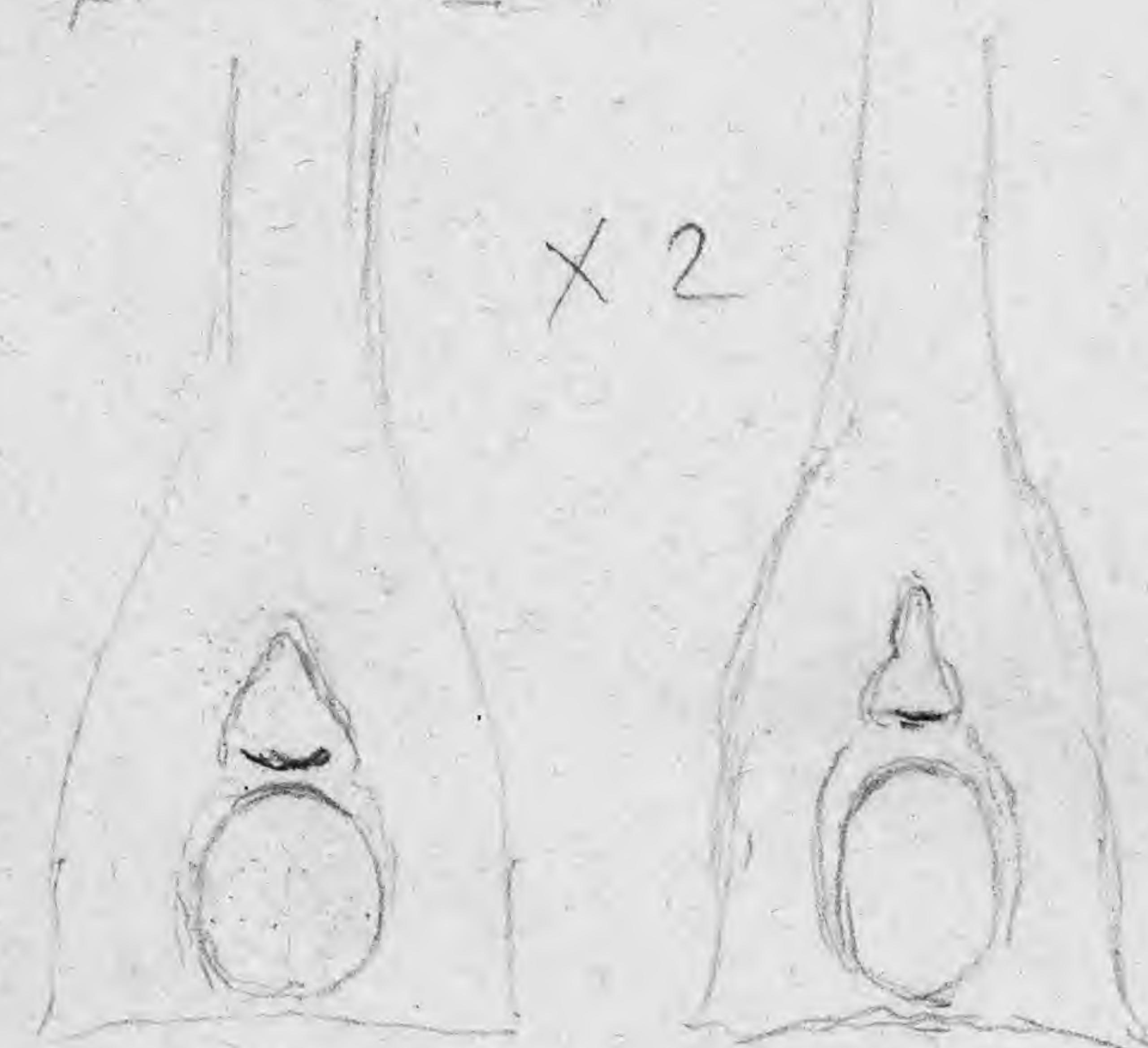
Oct 2 1866

Washington, D. C. Sept 25 1866

x2

leaves 12
inches long

x 2



one of the exterior leaves
with macrospores

inner leaf
with
macrospores

x615

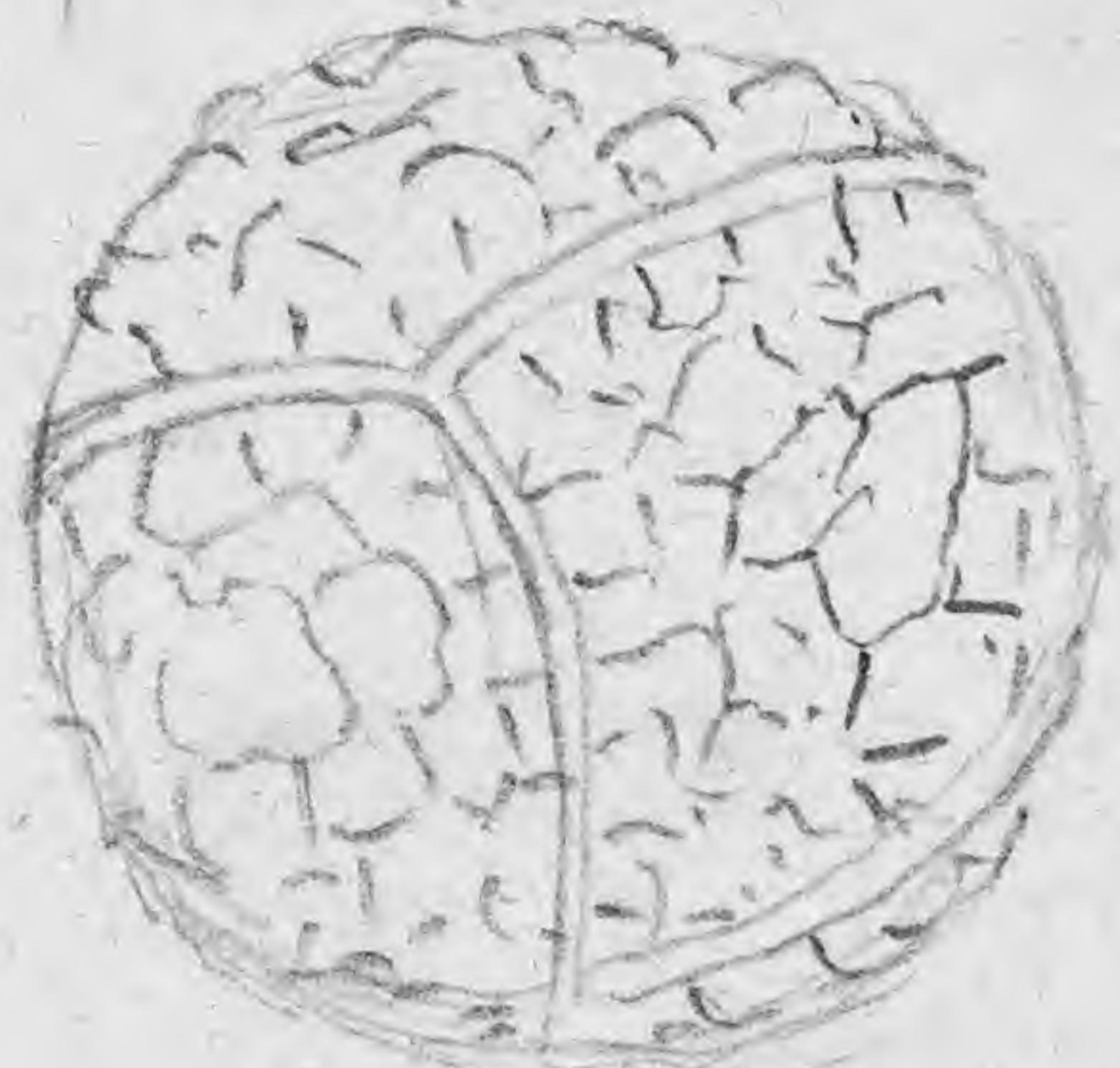
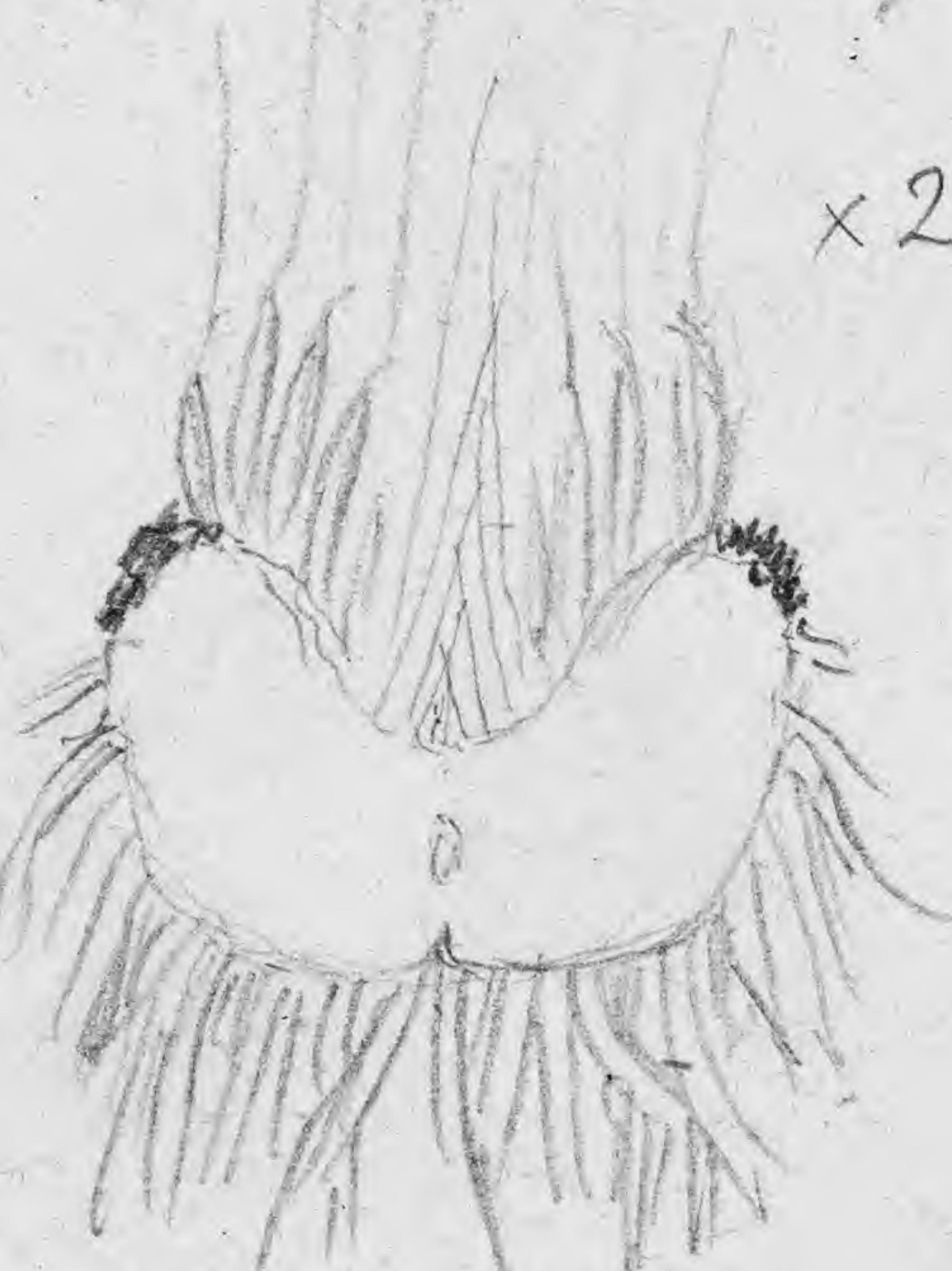


smoothly
papillose



others more so

0.025 mm.



23.5 - 27.7 mm

60...

= 0.39 - 0.46 mm
mostly 0.43



0 1 2 3 4 5 6 7 8 9 10

cm

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13819



0 1 2 3 4 5 6 7 8 9 10

cm

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Isotrichia valida ? Oct 2 1866

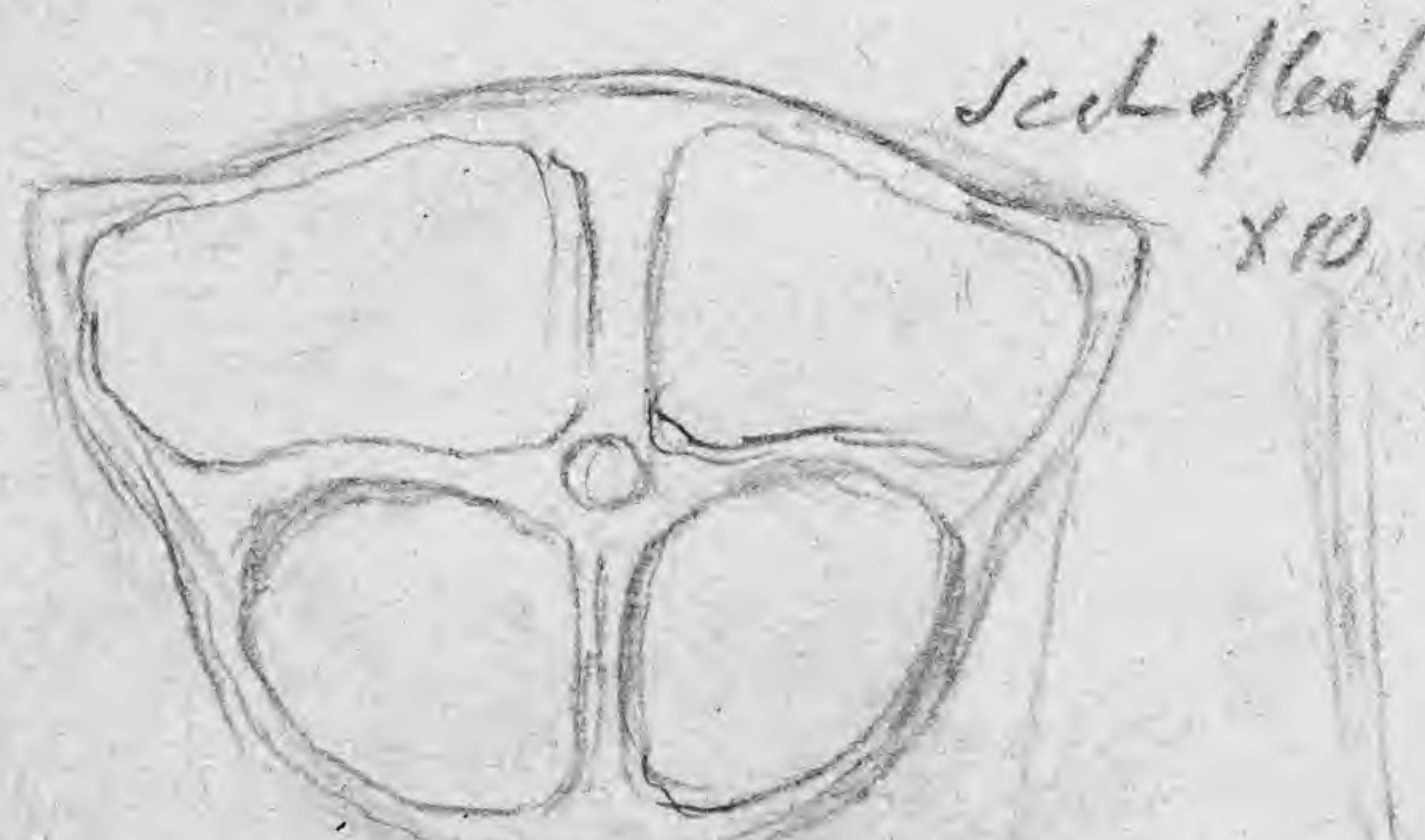
largest specimen of the lot

60-70 leaves, 20-21 inches long
Wilmington, early Sept 25 1866



0.024-0.027

and spm x 415 - papillae



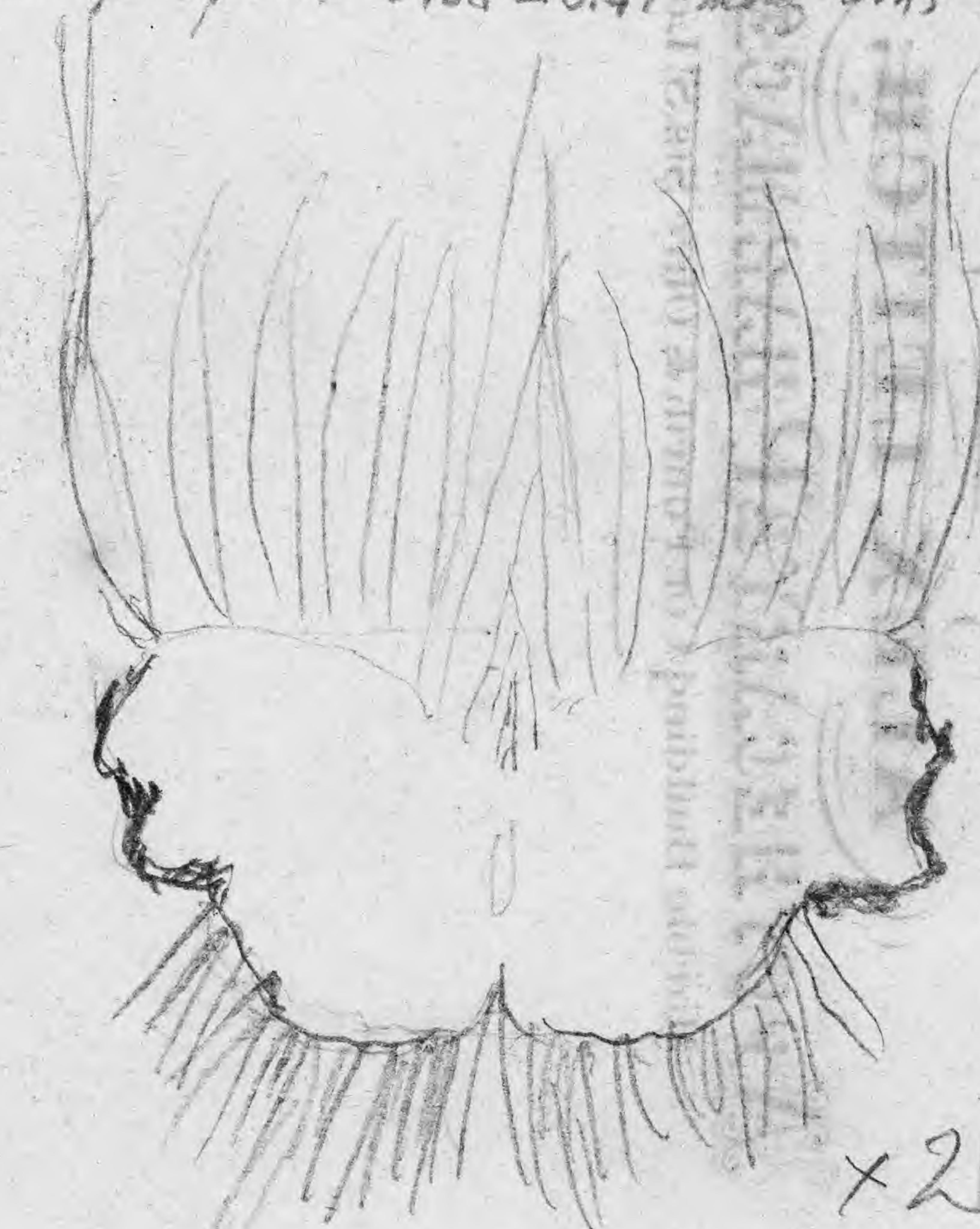
x2

macrosporangia

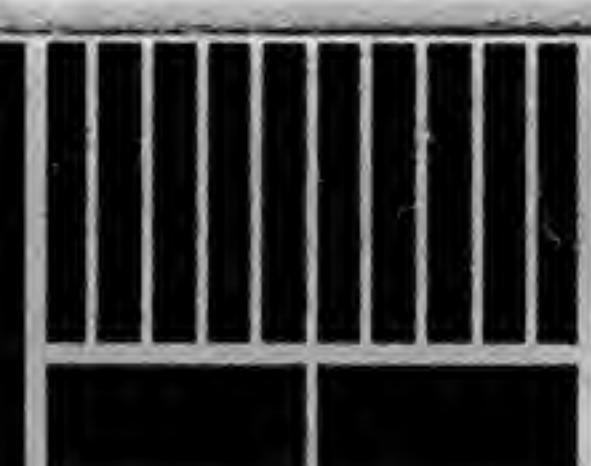
diam of spores 0.38-0.47 mm 0.45

60

23-28 mm 27 mm



x2



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL
GARDEN

13820

ALEX. LEITCH,
APOTHECARY & CHAPMAN & SONS,
Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10
cm

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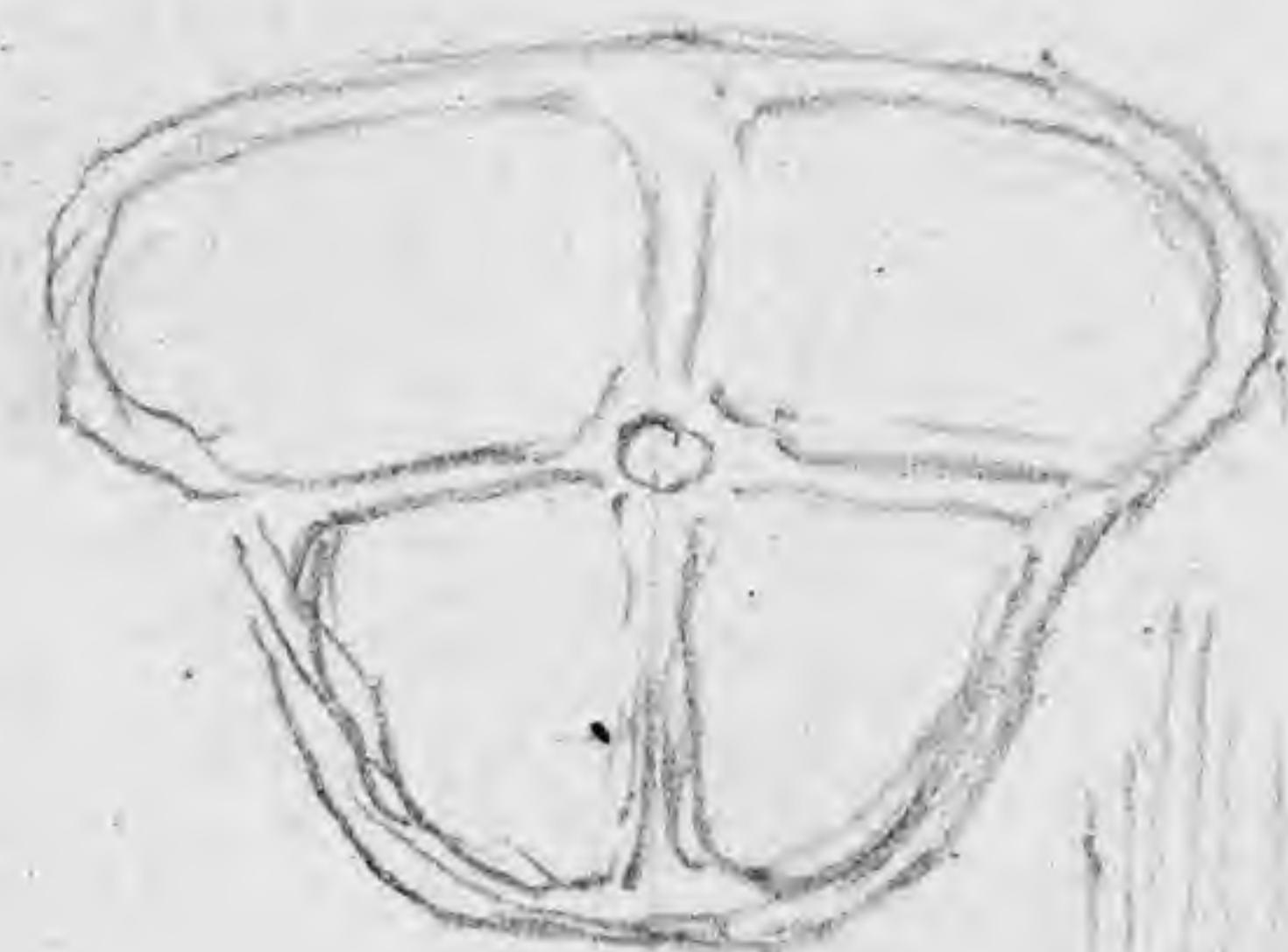
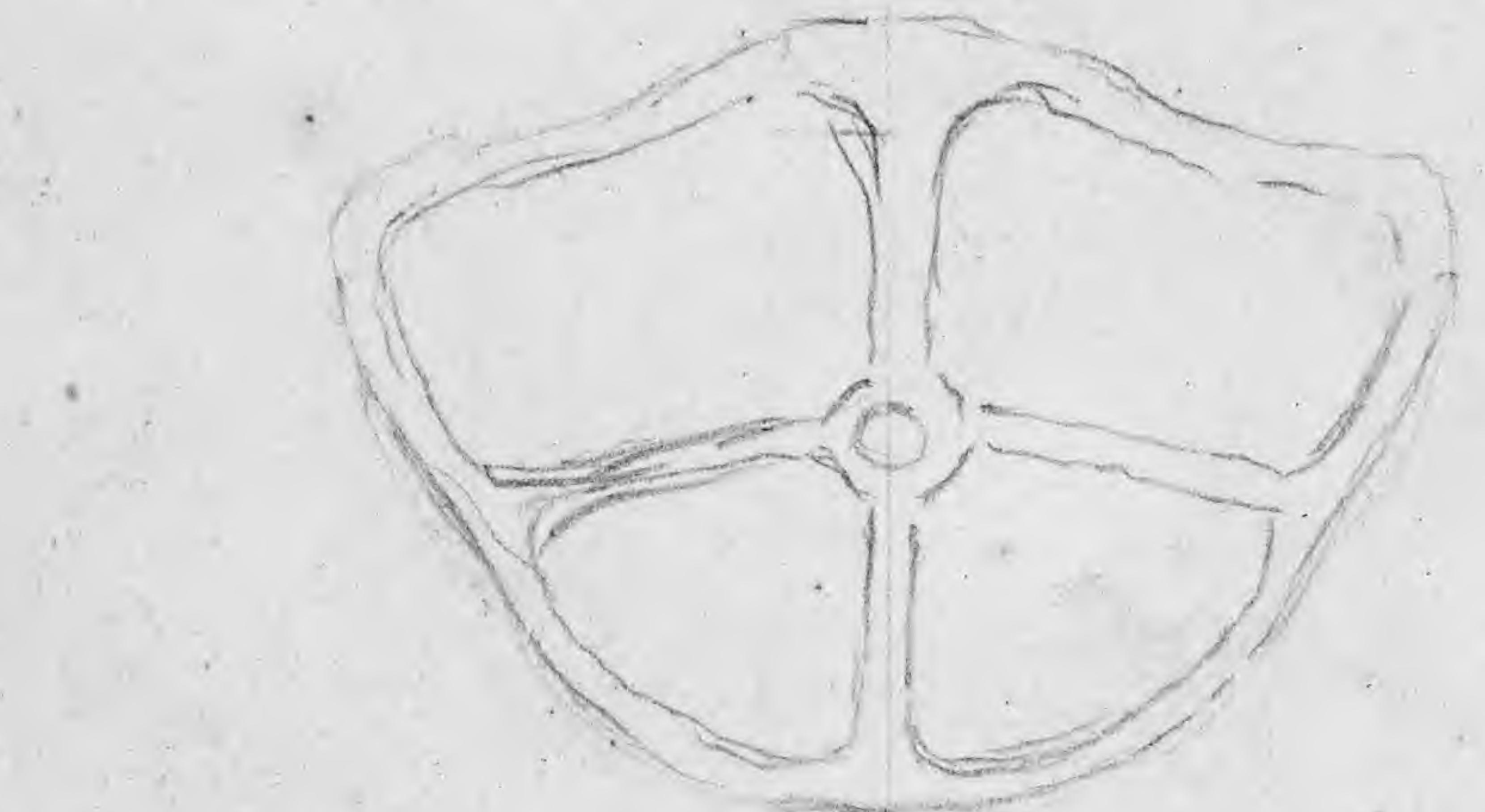
MISSOURI
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Isocoma valida

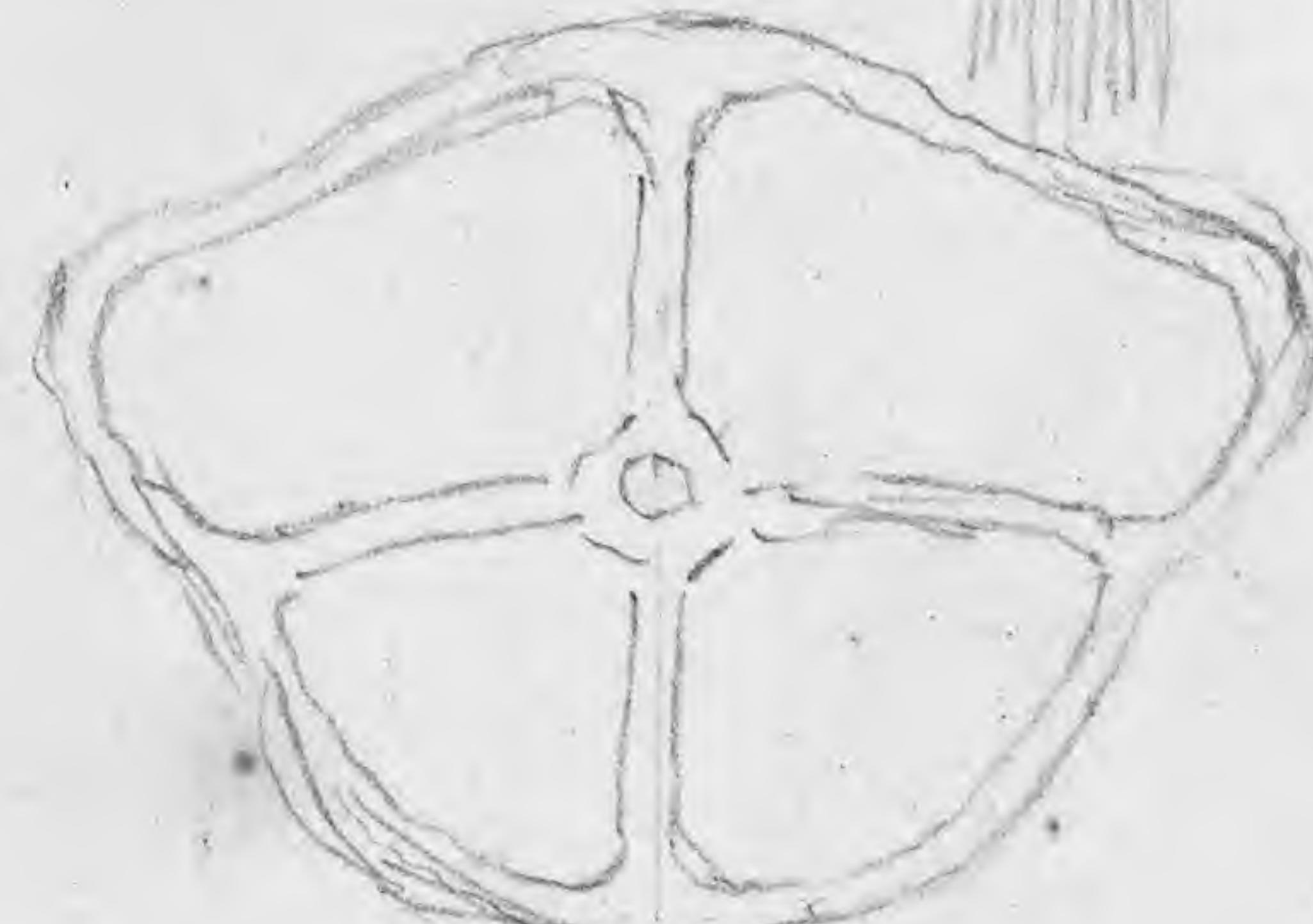
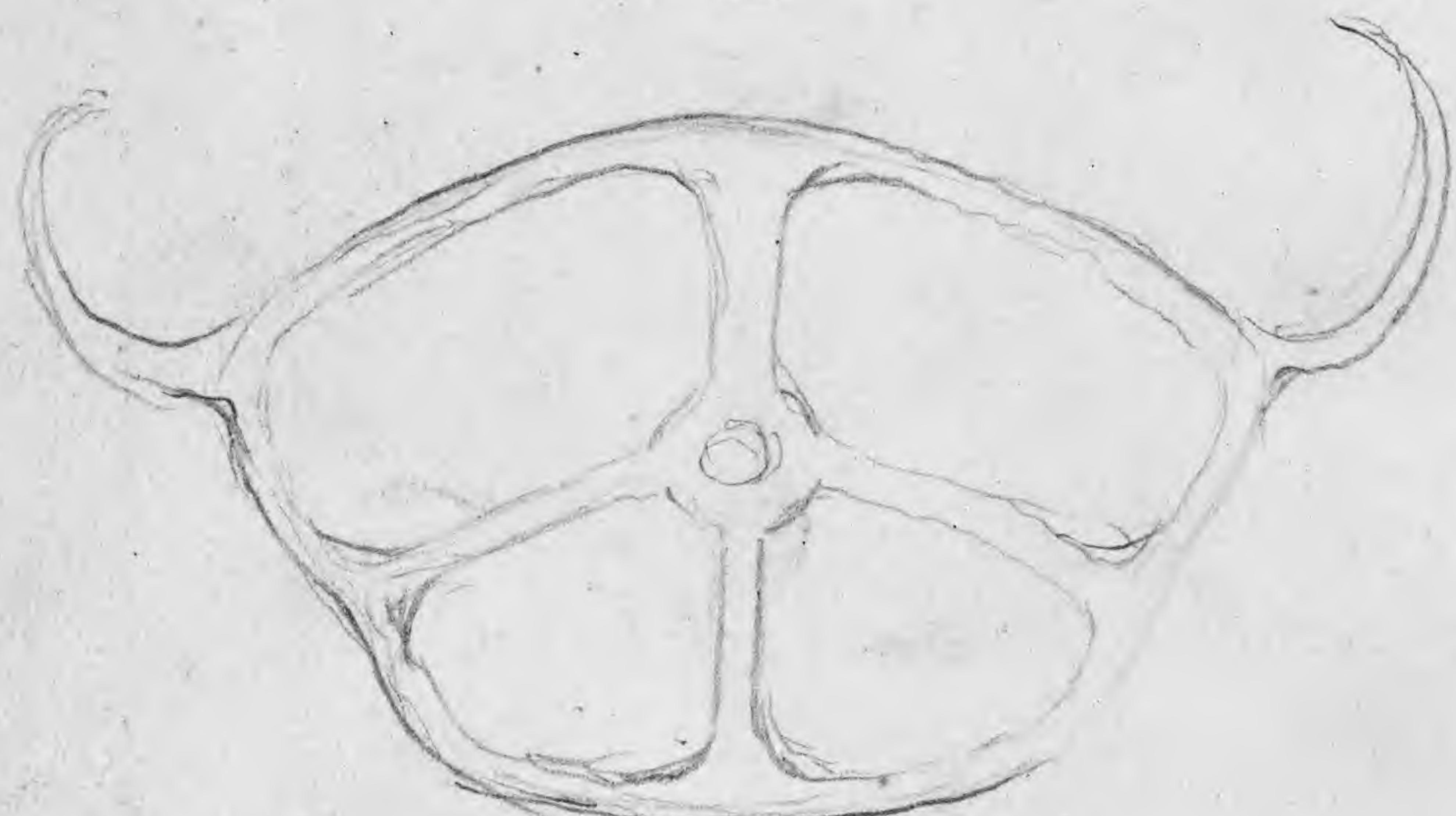
Sept 28 1866

Wilmington, Delaware, Canby, 21 Sept 1866 leaves 18-22 in. long

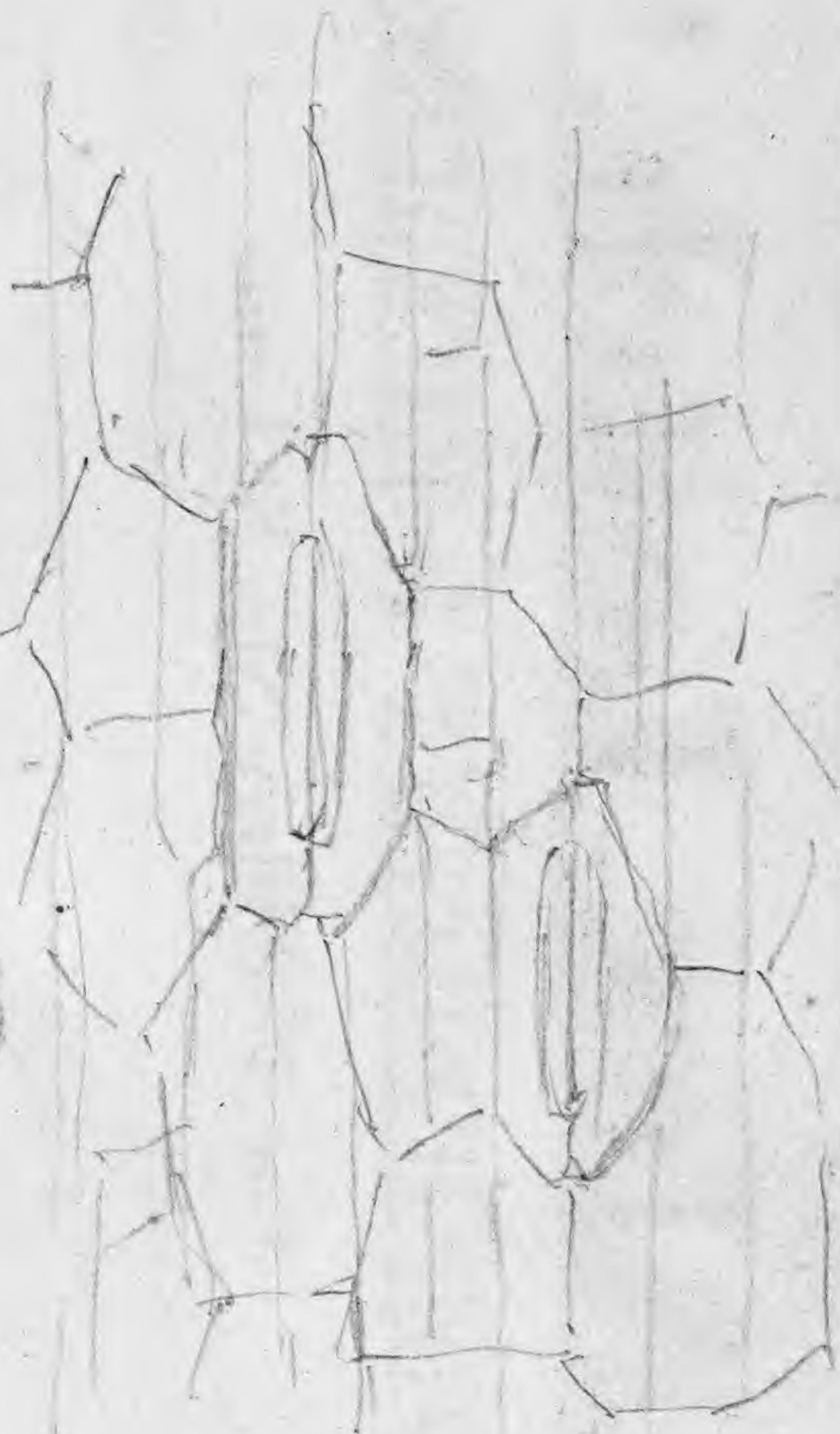
seed of largest leaves x10



liber cells
x280



x280



0 1 2 3 4 5 6 7 8 9 10
cm

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BOTANICAL
GARDEN

13821

ALEX. LEITCH,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0

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10

cm

copyright reserved




MISSOURI
BOTANICAL
GARDEN

Isoetes valida

Sept 28 1866

Delaware Co. Sept 21 1866

largest specimen
with 180-190 leaves
all of leaves $7\frac{1}{2}$
inches circumferent
leaves 18-22 inches
long



0
cm

1

2

3

4

5

6

7

8

9

10

copyright reserved



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BOTANICAL
GARDEN

ALEX. LEITCH

APOTHECARY & CHEMIST.

Cor. 4th & Olive Sts., St. Louis.



0

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cm

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MISSOURI
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Isotetra valida

Sept 29 1880

Wilmington Sept 21, - County

x60



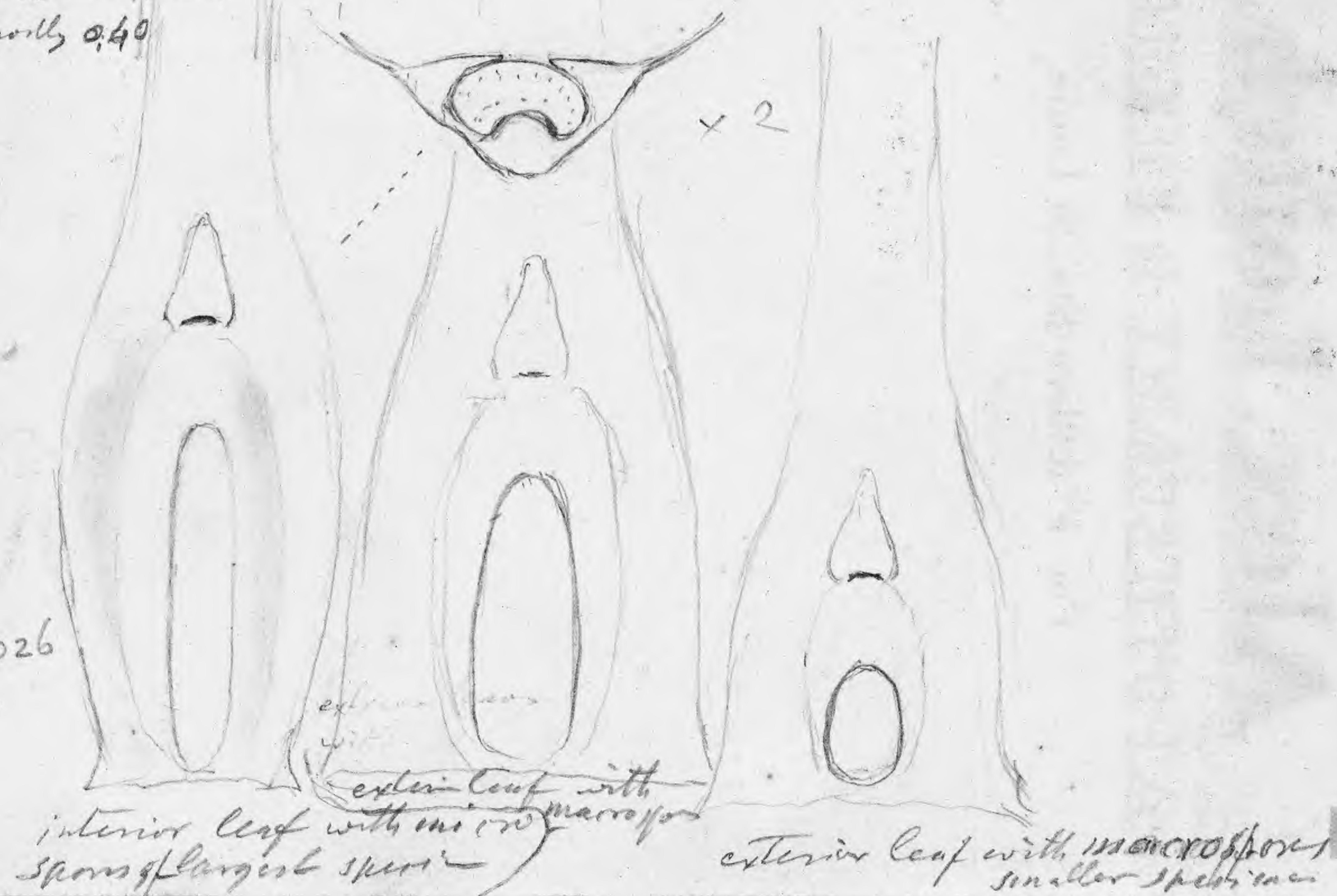
angles prominent

19-28.5 mostly 24
60 60
= 0.32-0.48 mm
mostly 0.40



x415

0.025-0.027, mostly 0.026
mm.



0 1 2 3 4 5 6 7 8 9 10
cm

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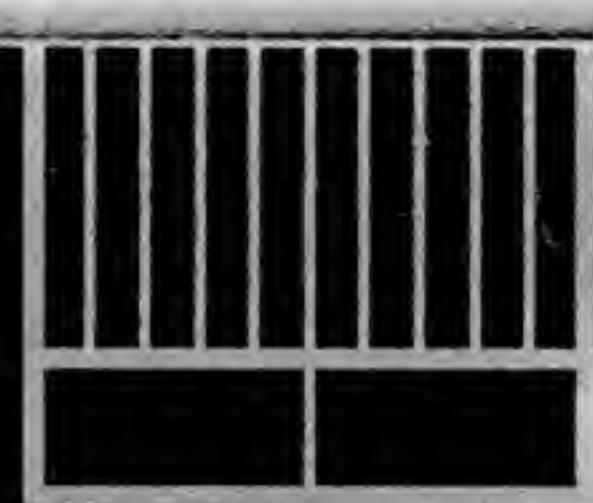
MISSOURI
BOTANICAL
GARDEN

13822

ALEX. LEITCH,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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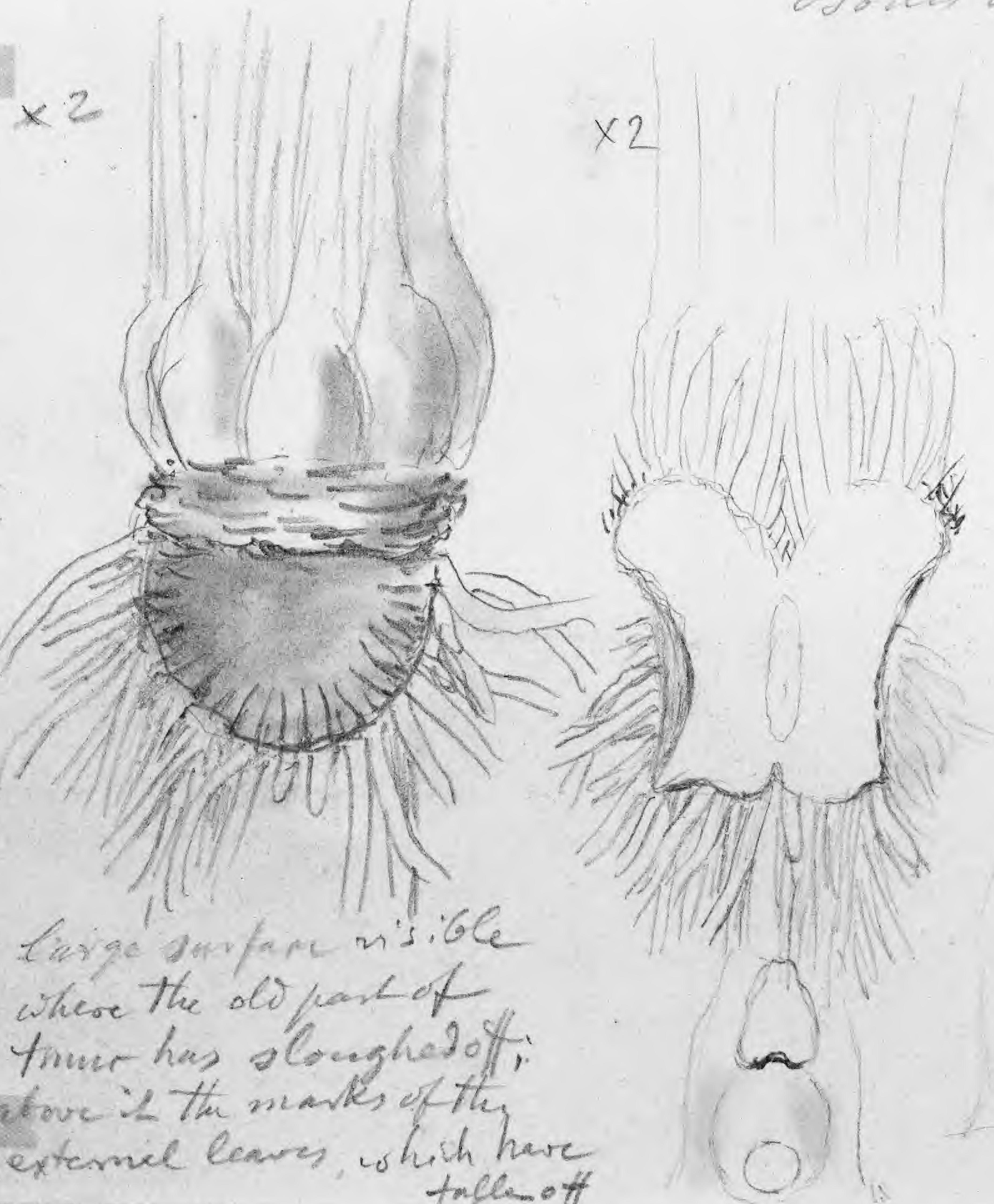
MISSOURI
BOTANICAL
GARDEN

Isotoma validula

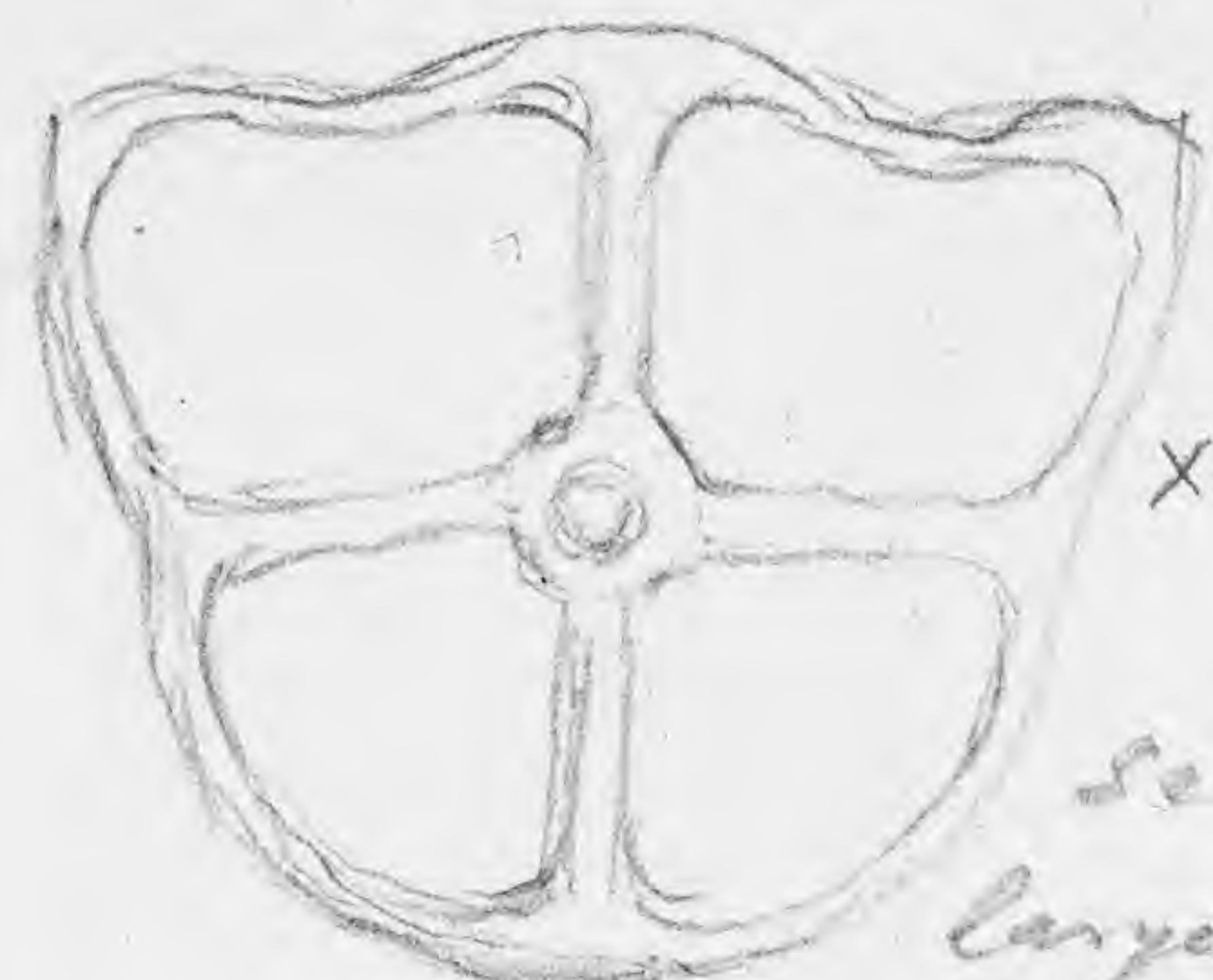
Oct. 6 1866

Lancaster, Pa.

H. C. Porter Oct 21st



Large surface visible
where the old part of
thru has sloughed off;
above are the marks of the
external leaves, which have
fallen off



sect of a
larger smaller inner leaf
stomata on upper & lower surface

x2 1411 22-26 = 0.37-0.43
Diam of spores 60 mm



x15
0.024-0.029 mm



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



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GARDEN

13823

ALEX. LEITCH,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

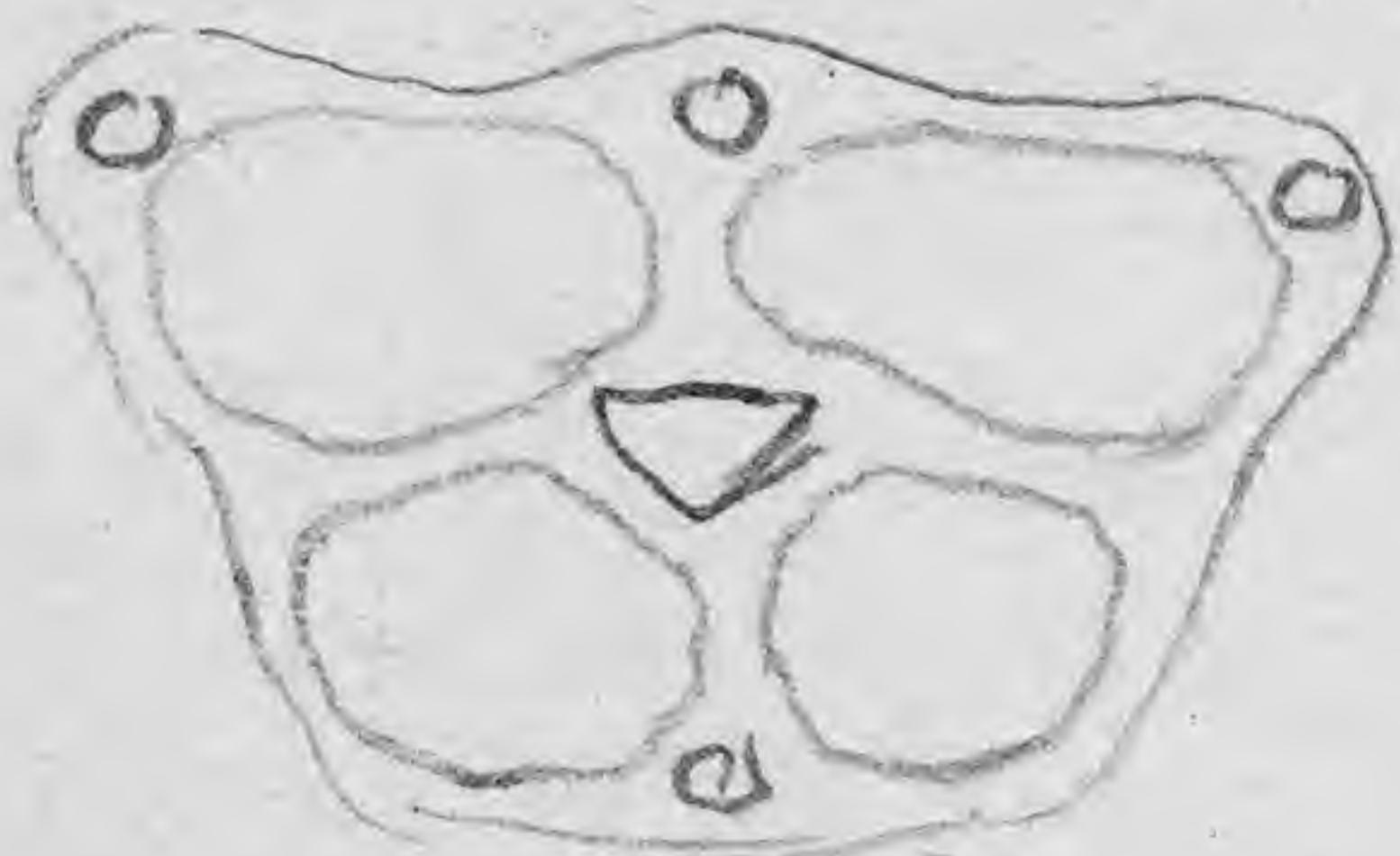
cm

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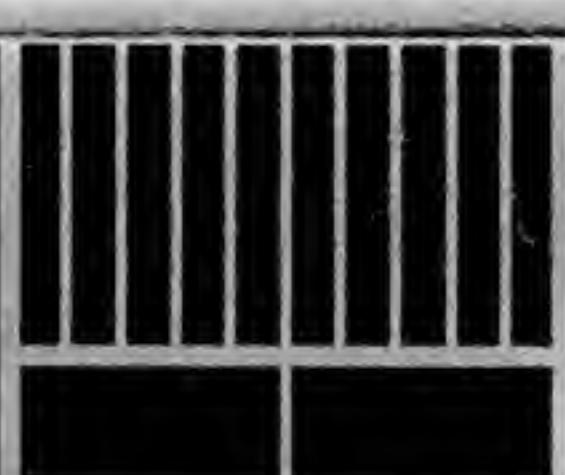
Festuca velutina x *Leptoleuca* April 16 1867



dry leaf soaked, section
treated with caustic
potash - 4 per-
cent - peripheral
canals
very plain



section of a delicate
winter-grown fresh leaf
no peripheral last
bundles



0 1 2 3 4 5 6 7 8 9 10
cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13824

X. J. Teitcher
CARRY & CEMENTIST

th. & Olive Sts. St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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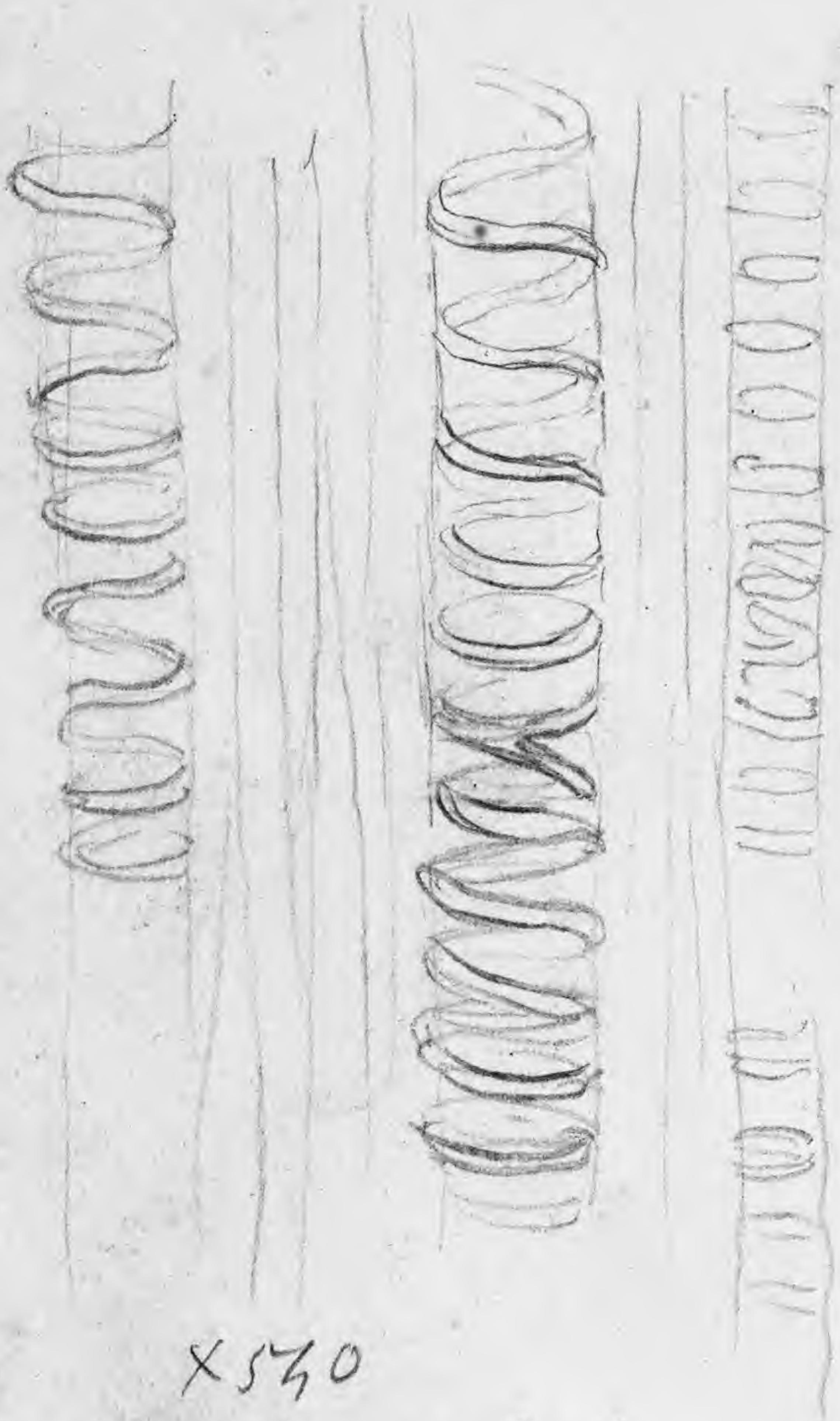


4 peripheral bast bundles

Soctes val. de

Carby 1886

April 25 1867



× 540

Spiral vessels &
bast cells from the
central bundle.

which I have not seen in other species, yes, in *Euglossa*

Stomata only partially distributed, in series, over
the air tubes, none on great part of the surface

longitudinal

Examination of a leaf 40 centimeters
long, for stomata.

1. 10 centim. pale, no stomata
2. 10 - 12 centim from base green, stomata
very sparing;
3. 20 centim. from base stomata abundant
4. 30 - - - - - abundant
5. 40 - - - - - abundant.



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI
BOTANICAL
GARDEN

13825

ANEX. Leitch,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
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GARDEN

June 17 1867

Isoetes Engelmanni
var *valida*, sed vdo angusti

x2

new locality, small pond
near W. L. C. - Del.

June 13 1867

W. H. Cramby



Sporangia small and soft yet -
so rarely marked - old part of
frankie in larger specimens has
all fallen off - in small ones
all damaged, but still adhering

transverse development of leaf a little
thinner than vertical one, form of
2-4, latter of 4-5 layers of cells



0 1 2 3 4 5 6 7 8 9 10

cm

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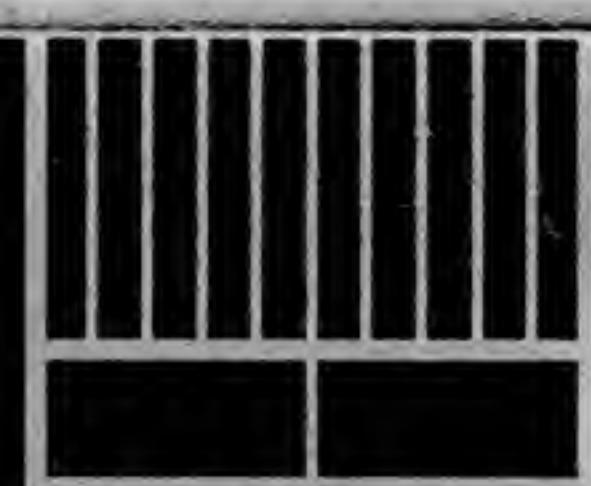


MISSOURI
BOTANICAL
GARDEN

13826

ALEX. LEITCH,
APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

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Scler. Engelmanii

Sept 7 1867

var. validia from Delaware 066

Cult at Illinois

Drawn of spores



$$\frac{21.5-25.5}{60} = 0.36 - 0.42 \text{ mm}$$

Spores very strongly reticulated



$$\frac{10.5-12}{41.5} = 0.025 - 0.029$$

x2



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cm

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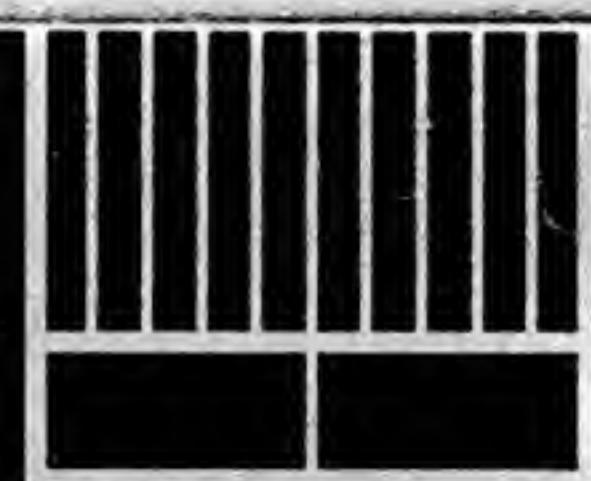


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Boettcher & Tuzetianum? Nov 3 1866

yearlings or of last year?

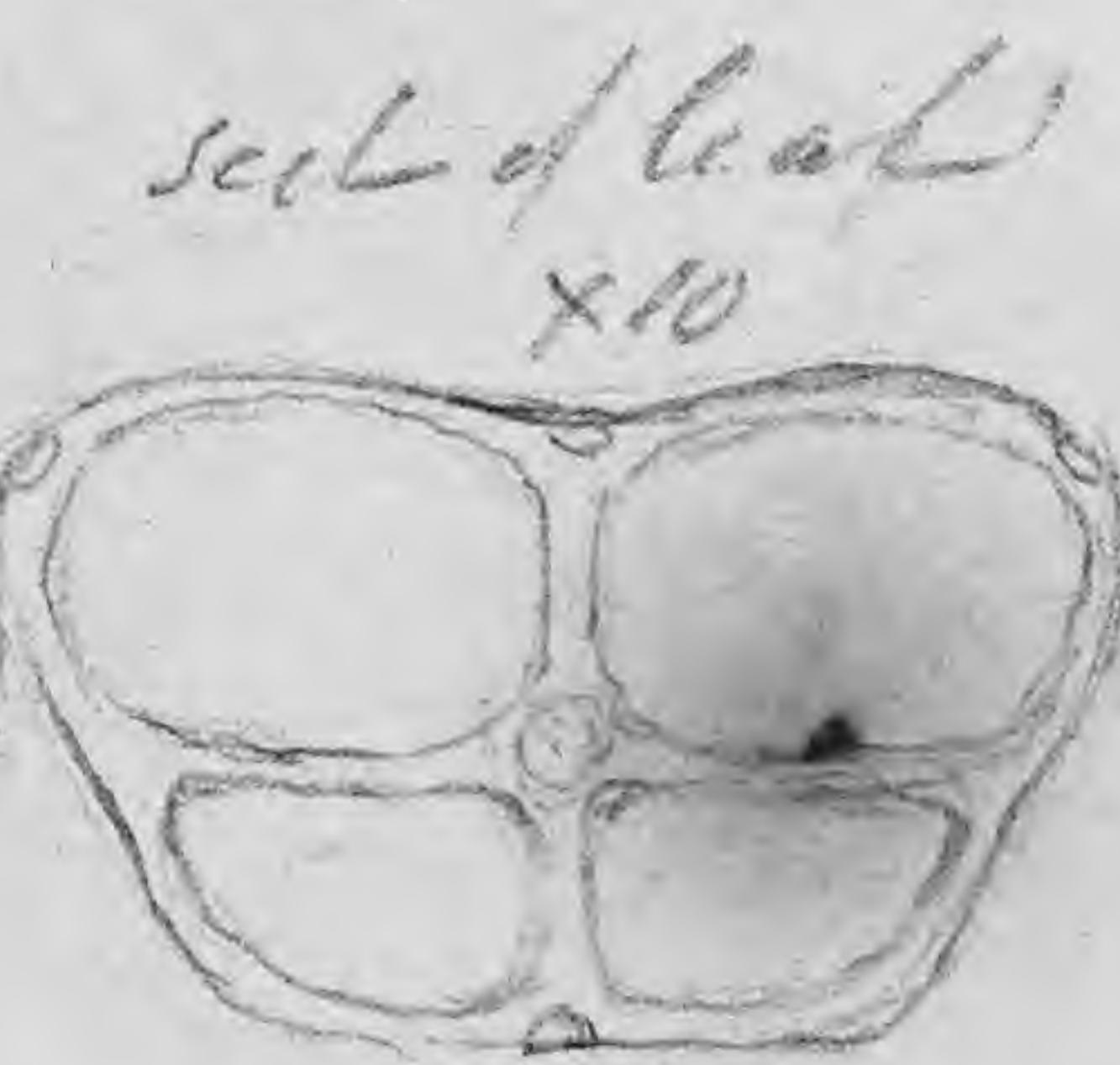
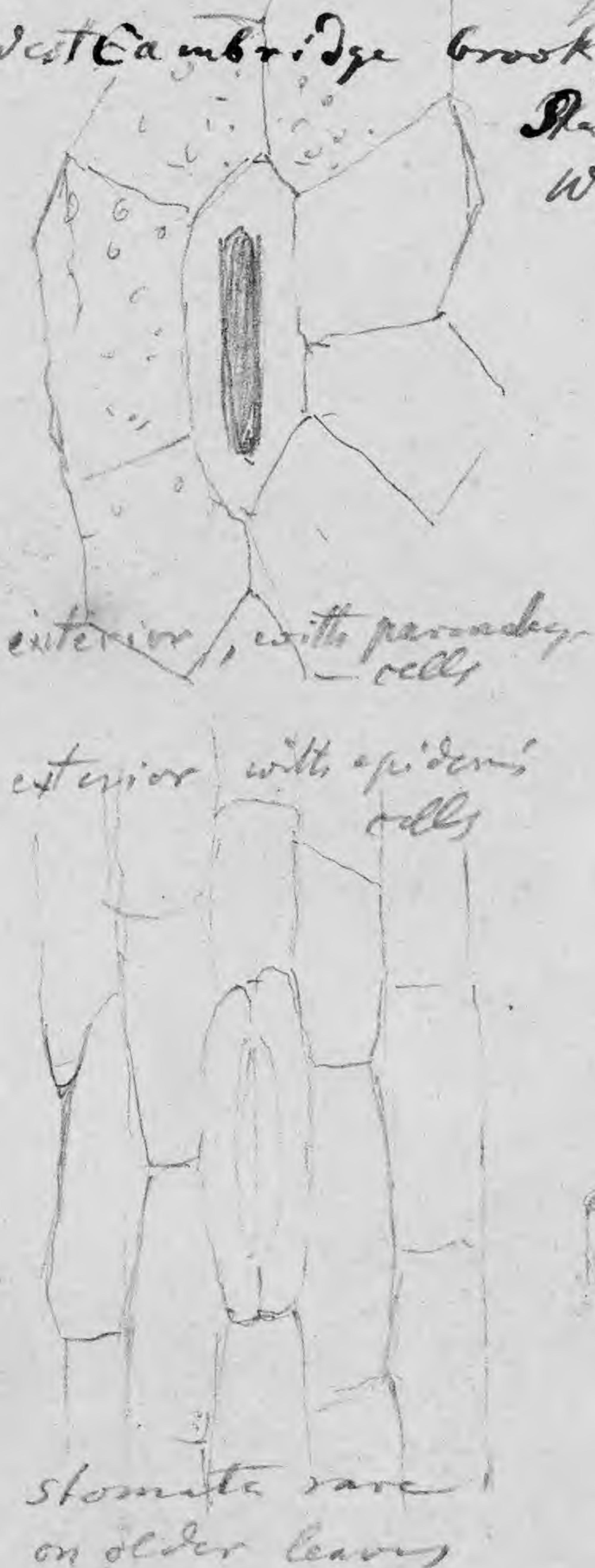
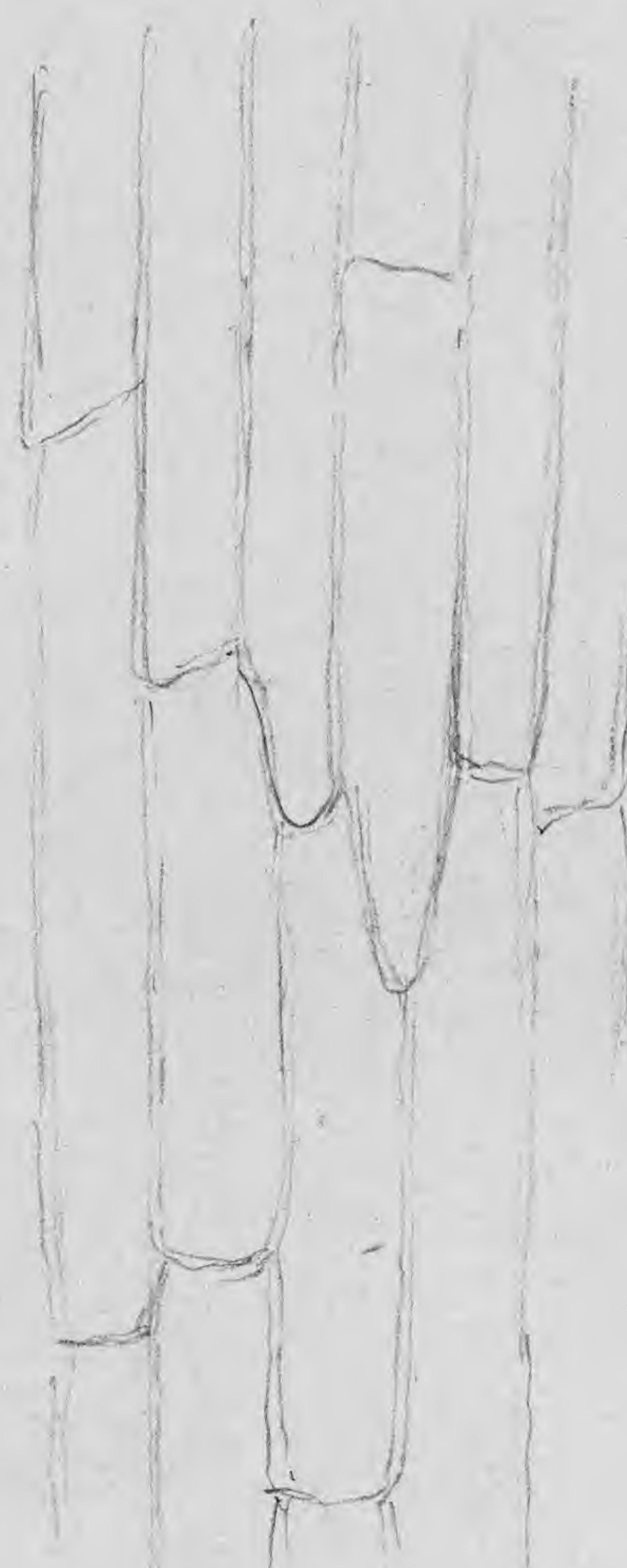
West Cambridge brook, below the millpond

Station No. 6

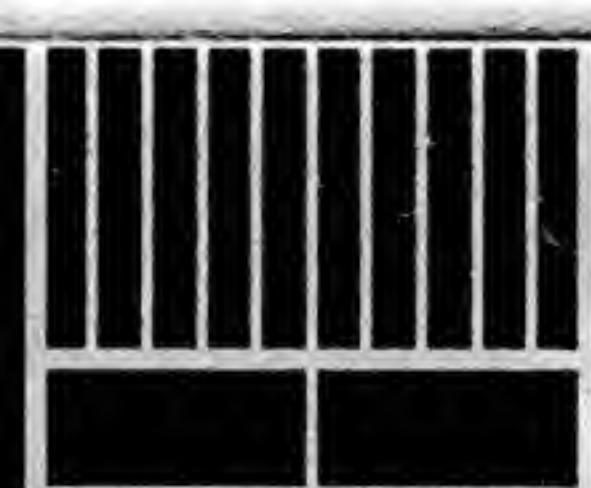
ponds 5-8 $\frac{1}{2}$ inches

W. Booth Oct. 29

long, fresh green,
15-20 - sterile



4 regular East bundle $\frac{25}{6}$ 67



0 1 2 3 4 5 6 7 8 9 10

cm

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Isoetes valida

Ditches near the Washington and Baltimore
Railroad, near Stanton Station, 6 miles
SW of Washington.

Leaves 20 to 25 inches long.



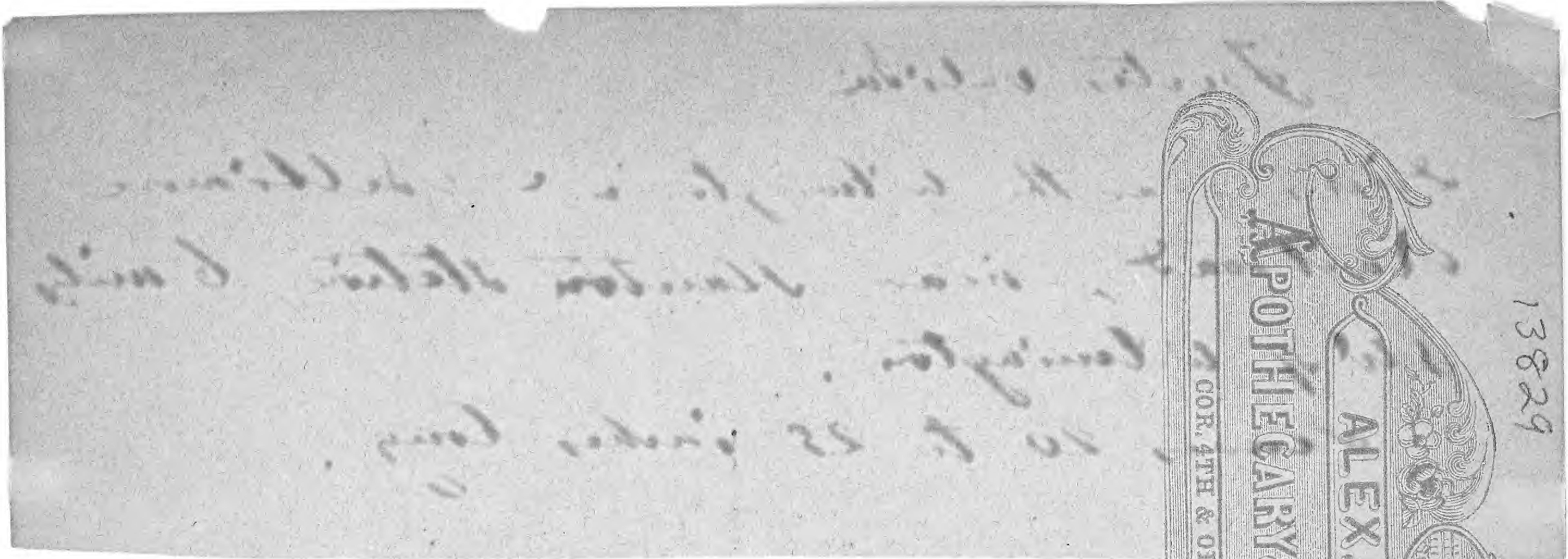
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cm

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